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Awareness of adult characteristics by the faculty in the Maricopa County Community College district.

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AWARENESS OF ADULT CHARACTERISTICS BY THE FACULTY IN THE MARICOPA COUNTY COMMUNITY COLLEGE DISTRICT

A Dissertation Presented

By

MAXINE ELLEN ROSSMAN

Submitted to the Graduate School of the
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Education

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ABSTRACT

Awareness of Adult Characteristics by
the Faculty in the Maricopa County
Community College District

May, 1977

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The purpose of this study was twofold: (1) To ascertain the level of awareness among the full-time faculty of the Maricopa County Community College District of the following selected characteristics of the adult learner: (a) physiological changes in the adult, (b) mental abilities in the adult, (c) psychological characteristics of the adult, and (d) orientation of the adult learner. (2) To use information about the level of awareness as a basis for recommendations in relation to faculty development.

To accomplish the purpose of this study, five null hypotheses were formulated concerning differences in awareness by faculty, utilizing the independent variables of age, sex, institutional affiliation, teaching experience, and adult education background.

The population included all full-time faculty in the five community colleges in the Maricopa County Community College District. A random sample of 150, stratified according to sex, was drawn from the population.

A questionnaire, developed by the researcher, based on an extensive review of the research in the area of adult learner characteristics, was used to establish faculty awareness. The instrument consisted of 65 items—5 demographic questions and 60 general statements—divided into four areas:

1. Orientation of the adult learner (15 items).
2. Physiological changes in the adult (15 items).
3. Mental abilities in the adult (15 items).
4. Psychological factors in adult learning (15 items).

To insure that the questionnaire had face and content validity, the instrument was submitted to a panel of experts, and administered to a pilot group of full-time faculty at the five colleges in the Maricopa County Community College District and two adult education graduate classes at Arizona State University. Based on the results of the screening procedures, the questionnaire was modified and revised.

The statistical technique utilized was multivariate analysis of variance. The MANOVA F test was computed to determine if there were overall significant differences among the mean scores of the full-time faculty, by factor, for the four dependent variables. The univariate F test was run to identify differences in the specific variables. The probability of accepting or rejecting the null hypotheses was at the .05 level of significance.

The analysis of the data indicated the following results:

Community college faculty, as a group, were not aware of 50.27 percent of researched material pertaining to the characteristics of the adult learner.

The community college faculty were least aware of the areas pertaining to physiological changes and mental abilities of the adult learner.

The community college faculty were most aware of the areas relating to psychological factors in adult learning and the adults' orientation to learning.

Females had a greater awareness of the characteristics of the adult learners than did males.

Those faculty having had no adult education background scored lower on the characteristics of the adult learner than did faculty having attended either formal classes or workshops in adult education.

Faculty having the greatest number of years of teaching experience attained the lowest scores on the characteristics of the adult learner.

Faculty having had six to fifteen years of teaching experience attained the highest scores on the characteristics of the adult learner.

Based on the findings of the study, among the recommendations included were:

Instructors should further investigate the physiological changes in aging, the psychological factors in adult learning, the mental abilities of the adult learner, and the

orientation of the adult learner to further enhance their teaching effectiveness.

After further investigation of teaching effectiveness and questionnaire scores, school districts might consider the following:

1. Provide in-service training for full-time faculty in the area of adult learning characteristics.

2. Differentiate staffing by identifying those teachers best able to work with adults.

3. Require courses in characteristics of the adult learner for certification of instructional personnel.

4. Require courses in the characteristics of the adult learner for maintenance of currently certified instructional personnel.

5. Recruit more female faculty.

ACKNOWLEDGMENTS

The writer wishes to offer special tribute to her husband, Mark, by dedicating this dissertation to him. His unwavering support and his commitment to the belief of the equality of men and women is one of the many reasons this writer loves him.

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GENERAL NATURE AND PURPOSE OF THE STUDY

In the past our educational programs have focused on the young. We have considered education to be a "preparation for life more than a tool of continuing development and enrichment. There has been a growing dissatisfaction with the lock-step pattern of education, wherein the typical student proceeded with his or her studies without interruption from childhood until what was called "the completion" of that education. For all practical purposes, people were expected to "finish" their period of formal learning before entering the world of work (Bortner, 1974; Knowles, 1970).

This view of educational potential is being questioned and challenged when societal trends, such as the availability of increased leisure time, the acceleration of social change, the high rate of unemployment, the increase in the life span, the need for specialized training, the reentry of women into the labor market, the increase of multiple careers, and the shorter duration of jobs and the work week, are realities (H.E.W. Report, 1971; NACAE, 1974).

Concomitant to these trends is the fact that knowledge is becoming increasingly perishable (Commission of Professors, 1961:5-6). According to Alfred North Whitehead (1931), we are living in the first period of human history when the time span of major cultural change is considerably

shorter than the life span of individuals. More recently, Margaret Mead has pointed up the educational implications of this concept in the following words: "We avoid facing the most vivid truth of the new age: No one will live all his life in the world into which he was born, and no one will die in the world in which he worked in his maturity. . . . In today's world, no one can 'complete an education' . . . . We need children and adolescents and young and mature and 'senior' adults, each of whom is learning at the appropriate pace, and with all the special advantages and disadvantages of experience peculiar to his own age" (Cotton, 1968:25).

The rapid development of science has led not only to incessant technological change, but has also necessitated a thorough overhaul of the educational system. One of the most important consequences for the educational system is the need for a systematic and continuous perfecting of one's store of knowledge and updating of qualifications acquired early in life (Wroczynski, 1974).

Continuous or lifetime learning programs could offer much needed assistance to the growing number of adults returning to school. According to the United States Bureau of the Census, among students enrolled in undergraduate programs, the number twenty-two and older has been rising slowly but steadily in recent years. From 1960 to 1970, the number of men students twenty-two to thirty-four doubled, and the number of women students in that age group has tripled. In 1970,

roughly one-third of all undergraduates were twenty-two or older. One-sixth were over twenty-five. James Birren (1973) refers to this trend as the "graying" of American education.

The part-time adult student accounts for a large proportion of this returning adult population. According to an American Council on Education report, the number of part-time, postsecondary adult students increased 20.4 percent between 1969 and 1972, while the increase in full-time students was only 8.8 percent (Bortner, 1974).

Glass and Harshberger (1974) indicated that societal forces are building now which will accelerate the return of middle-aged adults to full-time student status. These include the ending of the Vietnam war with many of the veterans returning to school, the professional armed services which have caused the military to increase its emphasis on long-term formal schooling for its personnel, and the increased demand for career retraining.

Entine (1976), in looking at motivations that may propel older persons back to higher education, highlights two significant areas—the economy and retirement: (1) In 1974 and 1975, unemployment created by a recession created serious consequences for older workers. The older worker (over forty), once unemployed, is likely to stay unemployed for up to 70 percent longer than the younger worker. (2) It is now estimated that the average retirement age will continue to drop so that by the year 2000 the average retirement

age—or, as Neugarten (1975) suggests, the age of "first retirement"—will be fifty-five rather than the sixty-two years it is now. At the same time, the population fifty-five and over is expected to grow from forty-one million persons today to fifty-seven million persons by the year 2000. Neugarten (1975) indicates that with the anticipated increase in life expectancy the postretirement period of the life span for man will be about twenty-five to twenty-eight years instead of the present thirteen years. The implications for this change suggest a meaningful division between the "young-old" and the "old-old." She defines the young-old as from fifty-five to seventy-five years of age, and the old-old as from seventy-five upward. She further indicates that age fifty-five is beginning to be a meaningful age marker in the life cycle because of the lower age of retirement.

As we look forward to the future we can expect even greater increases in the numbers and in the age of adult learners. Since 1900, the average life expectancy has increased by thirty years, while the birth rate has declined (Birren and Woodruff, 1973). Births in 1972 and 1973 were more than one million fewer than the number reached in the latter 1950's. In 1945, when World War II ended, the birth rate stood at eighty-six per one thousand women of childbearing age, and births totaled a little short of 2.9 million. As indicated in Figure 1, an upward trend continued until the peak of 1957. The number of births did not fall

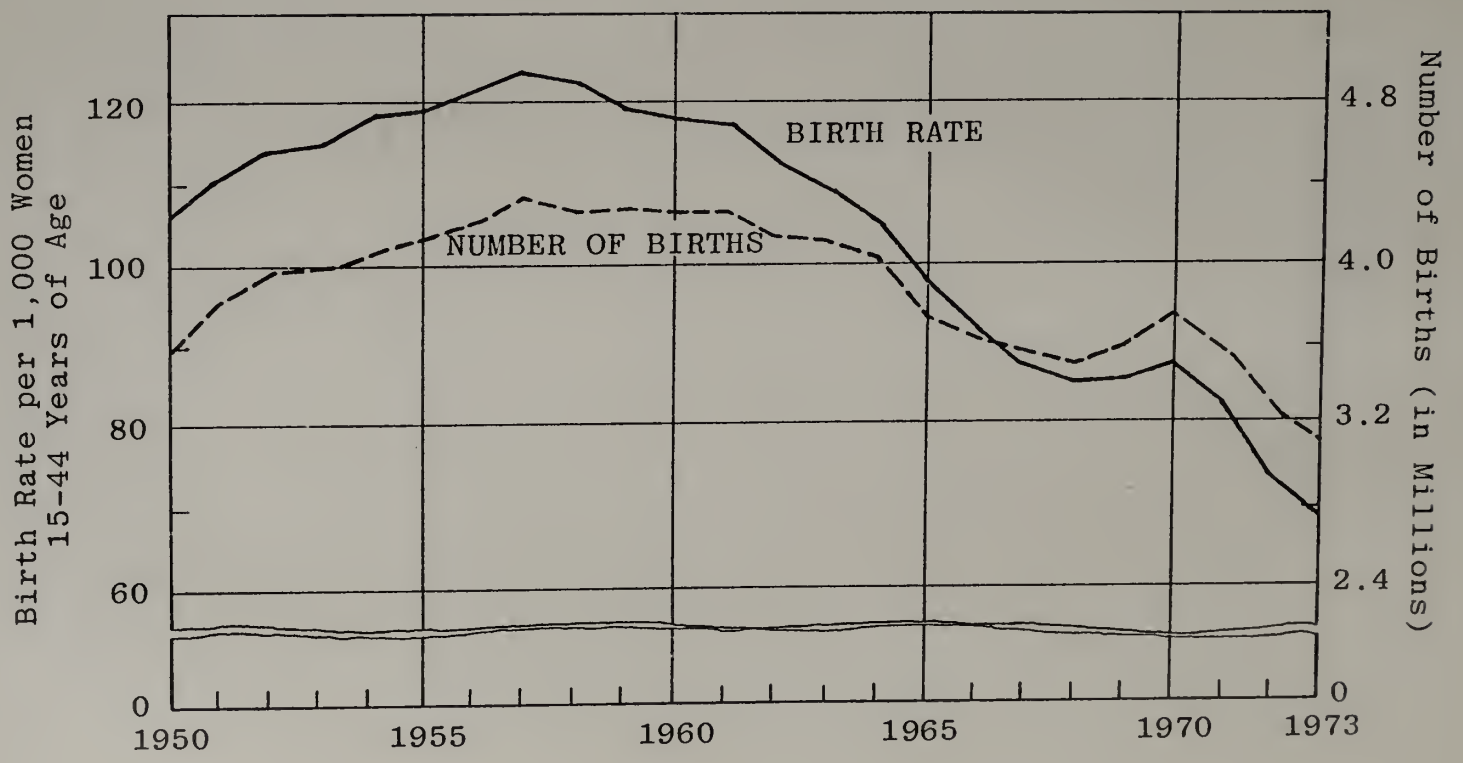

Figure 1

Birth Trends in the United States

below the four million mark until 1965, after which the decline already noted occurred (NACAE, 1974).

The United States Office of Education has identified seven issues it regards as critical for education planning over the next five to ten years. One of these issues is the growth in the middle-aged and elderly populations. From 1972 to 1990, it is expected that there will be an increase of fifteen million in the 35-64 age group and a seven million (32 percent) increase in the 65-up group. This will mean greater demands for continuing education and other adult enrichment programs. Only 32 percent of Americans age forty-five or older have graduated from high school (*Phi Delta Kappan*, 1976). Adult students are unequivocally the new majority in higher education!

A large proportion of these older students are entering the community colleges. Increasingly, community and junior colleges are attracting new groups of students—older than the typical college students—who pose unique problems to community college education (Hankin, 1973). Senator Mondale (1976) notes that, although the majority of part-time students are adults, classroom techniques and materials are still frequently geared to younger students.

It is imperative for teachers to recognize that the nature of adulthood requires an educational experience which, in certain ways, is especially for adults. The clue to better courses for adults lies in identifying the characteristics of

adulthood—characteristics which are relevant to the educational experience (Whipple, 1957:1).

Need for the Study

It has been only recently that definitive studies have been made of community and junior college students. Most of these ignore or only casually treat the adult student (Hankin, 1973).

Glass and Harshberger (1974) state that, as these mature adults move into educational settings which have been traditionally oriented to older adolescents and younger adults, more educators, who are going to find themselves working with middle-aged adults, will be singularly ill-equipped to handle these new students in terms of attitude and theory base.

Birren and Woodruff (1973) indicate that institutions of higher learning are remiss in not preparing teachers with information about the biology, psychology, and sociology of the life span. In teacher-training institutes, developmental psychology for the most part has meant child psychology. Teachers who are currently employed, as well as those now being trained, are not prepared to teach middle-aged and aged adults. At a time when the lack of educational opportunities over the life span is becoming an unavoidable issue, capable persons to exercise leadership are in short supply. This suggests a need for recruitment of personnel from adjacent specialties and special crash training programs dealing

with facts, theories, and techniques relevant to the needs of middle-aged and older persons. Dennis (1971) feels it will be necessary to structure the courses and curricula to take advantage of the proficiencies of the older learner as well as to compensate for his deficiencies.

Joseph Hankin (1973) contends that the institution has an obligation to enable faculty members to differentiate their instruction in order to accommodate differences—the differences in educating groups of adults from the typical college age group. This thought is reaffirmed by a plethora of experts in the field of adult education (Knowles, 1974; Kidd, 1973; Aker, 1971; McClusky, 1963; Dickinson, 1973).

Glass and Harshberger (1973) assert that, unless higher education is prepared to equip these new educators of adults with understandable, relevant concepts for dealing with the full-time middle-aged students, not only will the effectiveness of the learning situation be lessened, but lasting psychological harm may be done to the adult student.

The Maricopa County (Arizona) Community College District, which includes Glendale, Mesa, Phoenix, Scottsdale, and Maricopa Technical Community Colleges, exemplifies this increase in the number of adults returning to college. Over the past five years the Maricopa District has witnessed a general increase in total student population and a specific increase in the adult student. Along with this increase there has been a decline in the percentage of recent high school

graduates entering the community college district. Table 1 illustrates total numbers of students in the Maricopa District from the fall term of 1971 through the fall term of 1975. The table also indicates percentages of students twenty years and older, and twenty-six years and older, from fall, 1971, through fall, 1975.(Lindquist, 1975-1976).

Phoenix College, which is the largest institution in the Maricopa County Community College District, has a population of 13,900 students. Of those students, 81 percent are over twenty years of age and 48 percent are over twenty-six years of age. Recent high school graduates (those who graduated from high school in May or June of 1975) comprised 1,300, or only 9 percent, of the student enrollment (Lindquist, 1975-76).

With such large numbers of adults attending the Maricopa County Community College District, it is important that the teachers of these students be cognizant of the characteristics of the adult learner.

Statement of the Problem

The problem of this study was to determine the level of awareness of full-time faculty in the Maricopa Community College District of certain selected characteristics of the adult learner.

Table 1

Student Enrollment Pattern in the Maricopa County Community College District

Term	Total Enrollment	Percent Age 20 and Over	Percent Age 26 and Over
Fall, 1971	20,938	67	35
Fall, 1972	33,572	68	36
Fall, 1973	37,094	76	43
Fall, 1974	43,538	75	45
Fall, 1975	49,938	78	50

Purpose of the Study

The primary purpose of this study was to ascertain the level of awareness among full-time faculty of the Maricopa Community College District of the following selected characteristics of the adult learner: (1) physiological changes in the adult learner—vision, audition, and reaction time; (2) mental abilities in the adult learner—power vs. speed, learning capacity; (3) psychological factors in adult learning—self-concept, developmental stages, motivation, and interests; (4) orientation of the adult learner—andragogy, experience, adult learning orientation, and implications for the adult teacher.

In addition, this study obtained, by means of a questionnaire, the following demographic information: age, sex, institutional affiliation, teaching experience, and adult education background of full-time faculty at the Maricopa County Community College District. This information was collected to assess the level of awareness of adult characteristics.

Another purpose of this study was to synthesize the data gathered into a set of recommendations related to faculty development.

Definition of Terms

The following terms associated with the investigation are presented in alphabetical order and are described according to their use in the study.

"Adult student": Any full-time or part-time student over twenty-five years of age.

"Awareness": Score on questionnaire.

"Community college": A community college is a public institution of higher education, offering the first two years of schooling beyond the high school level and providing for a locality a comprehensive program of instruction leading to the attainment of the Associate of Arts degree, and including (1) transfer programs, (2) technical education transfer programs, (3) occupational programs, (4) continuing education, and (5) planned certificate programs.

"Full-time faculty": Contract faculty teaching at least twelve credit hours in various content areas.

"Maricopa County Community College District": The five colleges in Maricopa County, including Glendale Community College, Maricopa Technical College, Mesa Community College, Phoenix College, and Scottsdale Community College, under the jurisdiction of a central administration. The county extends over an area of 9,226 square miles and has a population of over 1,300,000. All five colleges are accredited by the North Central Association of Colleges and Secondary Schools.

"Part-time student": Students enrolled for fewer than twelve credit hours, who may be attending day or evening classes.

Delimitations of the Study

1. The findings in this study are not generalizable beyond the Maricopa County Community College District.

2. This study is limited to full-time faculty employed by the Maricopa County Community College District.

3. This study is limited by the degree of honesty exhibited by the respondents to the questionnaire.

4. This study is limited by the degree of validity and reliability of the questionnaire.

Hypotheses of the Study

Null Hypothesis 1: There are no significant differences in awareness level by age among the faculty at the five community colleges on the composite adult learner variables.

Null Hypothesis 2: There are no significant differences in awareness level by sex among the faculty at the five community colleges on the composite adult learner variables.

Null Hypothesis 3: There are no significant differences in awareness level by institutional affiliation among the faculty at the five community colleges on the composite adult learner variables.

Null Hypothesis 4: There are no significant differences in awareness level by teaching experience among the faculty at the five community colleges on the composite adult learner variables.

Null Hypothesis 5: There are no significant differences in awareness level by adult education background among the faculty at the five community colleges on the composite adult learner variables.

Adult education background includes: (a) attended one or more formal classes in adult education; (b) attended workshops, conferences, or institutes concerned with adult education; and (c) not participated in any adult education activities.

Organization of the Study

Chapter I presents the general nature and purpose of the study, need for the study, statement of the problem, purpose of the study, definition of terms, limitations of the study, hypotheses, and organization of the study.

Chapter II contains a review of the literature of selected related and applied research from books, journals, articles, and reports on selected characteristics of the adult learner.

Chapter III describes the methods and procedures utilized in this study. The population, sampling, procedures,

instrumentation, sequence of events, and data analysis procedures are included.

Chapter IV contains a presentation and analysis of the results.

Chapter V presents the summary, conclusions, implications, and recommendations based on the analysis of the data and findings of the study.

C H A P T E R I I

REVIEW OF THE RELATED LITERATURE

A review of the literature related to this study is reported in this chapter. It represents the basis for the development of the questionnaire on adult learner characteristics, and is divided into four sections dealing with selected characteristics of the adult learner: (1) physiological changes in the adult learner, (2) mental abilities of the adult learner, (3) psychological factors in adult learning, and (4) orientation to learning of the adult.

Physiological Changes in the Adult Learner

The physiological condition of the learner exerts a significant influence on learning that is often poorly understood and ignored by both the adult learner and the adult educator. Nearly every adult experiences some kind of physical disability that may be the source of some learning difficulty. This may result from an inherited characteristic, from injury or disease, from inadequate nutrition, or from the natural process of aging.

From whatever source it may arise, the physiological condition of the learner will affect learning and performance in a number of ways that need to be examined (Verner and Davison, 1971:1).

The following physiological areas will be examined in this section: vision, audition, and reaction time.

Vision

Adults with normal physiological characteristics depend more upon vision in learning than upon any other of the senses. It is estimated that some 85 percent of all learning occurs through vision. Although the life span of the eye exceeds life expectancy, there is a steady decrease in the average efficiency of visual functions with advancing age, even in otherwise healthy eyes. As a result, the percentage of the population with defective vision shows a sharp increase from 23 percent at age twenty to 95 percent at seventy years of age (see Table 2) (Verner and Davison, 1971:6).

Visual acuity.—The primary measurement that reflects the efficacy of vision is the measurement of visual acuity (Geist, 1968; Birren, 1964). Studies have indicated that visual acuity attains its maximum at about eighteen years of age (Florida Department of Education, 1973). The near-point of vision begins to move away from the eye after ten years of age, and the most striking change occurs between forty-five and fifty-five years of age (Verner and Davison, 1971:7).

The decrease in vision after, or at least beginning at, age forty appears to reflect changes in at least four different factors: pupil diameter, decreased ability to adapt to the dark, increased sensitivity to glare, and yellowing of the lens (Bischof, 1976:104-5).

Table 2

Estimated Percentage of the Population with Defective Vision

Age	Percent Defective
Twenty	23
Thirty	39
Forty	48
Fifty	71
Sixty	82
Seventy	95

Pupil diameter.—The pupil size of the eye tends to diminish with age, thus reducing the amount of light reaching the retina. Perhaps the most sensitive indicator of the efficiency of the visual system is shown by the minimum light threshold of the fully dark-adapted eye (Birren, 1964; Troll, 1975).

Dark adaptation.—Dark adaptation is the phenomenon wherein there is an increase in visual sensitivity after remaining in the dark. It has been repeatedly demonstrated that the dark-adaptation threshold increases with age (Birren and Shock, 1950; McFarland and Fisher, 1955; Domey, McFarland, and Chadwick, 1960; Botwinick, 1973:122).

Illumination.—It is possible to compensate for the changes in pupil size by increasing the amount of external illumination. For a normal learning task an adult at age twenty requires 100 watts of illumination, but by age fifty 180 watts are required for the same task to compensate for pupillary changes (see Table 3) (Verner and Davison, 1971:9).

In a study by Guth *et al.* (1956) on the lighting requirements of older workers, each subject whose eyes were corrected for refractive errors attempted to read 10 seven-letter words under different conditions of illumination. Results indicated that as one ages greater illumination is needed to obtain equal visual recognition.

Table 3

The Progressive Increase in Wattage Required for Visual Tasks

Age	Wattage Required
Twenty	100
Thirty	120
Forty	145
Fifty	180
Sixty	230
Seventy	300
Eighty	415

Contrast.—Another important aspect of illumination is the matter of contrast. The learning task or stimulus must be set apart from its background so that it stands out as separate and distinct from its surroundings. Contrast has a pronounced effect upon the speed of reading, and reading is reduced significantly when the words being read are not in sharp contrast with the paper on which they appear (Verner and Davison, 1971). Weiss (1959) indicated that there is evidence showing that contrast sensitivity declines with age.

Also, loss in the accommodation function of the eye (ability to see clearly objects both far and near) begins at about age six and constantly decreases until about age sixty, after which it levels off until extreme old age (Bischof, 1976:105). This occurs due to loss of elasticity of the lenses of the eye, causing the older lens to have a more fixed focus, with reduced ability to adjust to objects close to the eye (Botwinick, 1973:121; Birren, 1964:89).

Color vision.—There are some definite changes with age insofar as color vision is concerned (Geist, 1968; Dickinson, 1973; Botwinick, 1973). After age thirty-five, more blue light is needed to get a sensation of blue. This loss of yellow-blue discrimination diminishes as one moves toward the red end of the spectrum. Thus, after age thirty-five, learning tasks involving color will need to use strong rather than subtle tints (Gilbert, 1957; Birren, 1959).

Questionnaire construction.—The following questions were derived from the section on vision:

25. For normal learning tasks an adult by age 30 requires 120 watts of illumination while by age 50 180 watts are required. [True]

28. Visual acuity attains its maximum at about 18 years of age. [True]

29. With advancing age the lens loses its elasticity and cannot focus readily. [True]

30. A major change in visual acuity occurs between age 50 and 60. [False]

31. About 85% of all learning occurs through the use of the eyes. [True]

Audition

In no capacity except sight are there greater changes at different stages in life than in hearing acuity. In most people the peak of performance seems to be reached before the fifteenth birthday, and there is gradual but consistent decline until about sixty-five (Kidd, 1973; Florida Department of Education, 1973; Kimmel, 1974).

In addition to the loss of hearing efficiency as age progresses, there is also a slowing of the central auditory processes. We slow up on our response to auditory stimuli as we age, and for this reason many aged individuals find it difficult to follow rapid speech in spite of little or no hearing loss (Hand, 1973).

The prevalence of impaired hearing is quite marked at the upper age levels. Beasley showed that the average

hearing loss showed a marked increase past the age of forty-five and continued to increase rapidly thereafter (Geist, 1968:68; Birren, 1964).

Sound frequencies.—The hearing loss in old age is not equal across all frequencies of sound. High-pitch tones are progressively less audible for the elderly (Kryter, 1960; Spoor, 1967). It appears that most individuals above the age of forty will show some loss of high-tone perception. Also there is a somewhat greater tendency for men to show impaired hearing than for women (Birren, 1964; Geist, 1968; Botwinick, 1973).

Discrimination.—The normal process of aging produces hearing loss due to physiological changes in the ear that result in reduced ability to discriminate among sounds, causing impairment in speech discrimination (Melrose, Welsh, and Luterman, 1963; Verner and Davison, 1971:13). Konig (1957) found that between ages twenty-five and fifty-five discrimination decreased slightly, but after fifty-five the decrease was marked. To compensate for normal hearing loss in an adult learning situation, it is important for the instructor to speak slowly and distinctly and with sufficient volume. Since loss of hearing reduces the ability to recall long sentences, an instructor should use short sentences—especially when giving directions for learning (Verner and Davison, 1971:13). This is especially important when dealing

with individuals suffering a hearing loss, as the inability to hear can produce emotional disturbances such as fear, insecurity, and the inability to learn new concepts (Florida Department of Education, 1973:6).

Questionnaire construction.—The following questions were derived from this section on audition:

21. Maximum auditory acuity is attained between 10 and 15 years of age. [True]

22. In the aging process, there is a loss of auditory acuity on the high tones. [True]

23. Loss of hearing reduces the ability to recall long sentences. [True]

24. Many older adults find it difficult to follow rapid speech in spite of little or no hearing loss. [True]

26. After age 15 there is a gradual, but consistent decline in hearing to about 65 years of age. [True]

27. The inability to hear can produce emotional disturbances such as, depression, anxiety, or frustration. [True]

33. There is a somewhat greater tendency for women to show impaired hearing than for men. [False]

34. As we age, we slow up in our reaction to auditory stimuli. [True]

Reaction time

In addition to the reduction of sensual acuity, studies indicate that one effect of aging (in the absence of disease) is a slowing of reaction time, regardless of the sensory modality and regardless of the muscle used for the response (Kimmel, 1973:367). Beginning as early as 1884,

with the data collected by Galton, reaction speed was found to increase from early childhood to the twenties and thirties and to have a fairly significant decline beyond the forties. The decline in the reaction speed after age thirty was confirmed by the researches of Miles, Bellis, and others (Lorge, 1963:2). Birren (1964) indicates that relative to other skills rapid reaction time appears to mature early. The figures suggest that reaction time reaches its minimum around age eighteen.

Botwinick and Kornetsky (1960) compared the skin responses of older and younger adults to an electric shock and to a pleasant musical tone. The skins of the older group responded to the shock less quickly than the skins of the younger group and also responded less quickly to the tone.

The generalized slowness of behavior in older persons is looked upon as being most probably an expression of a primary process of aging in the nervous system (Birren, 1964; Kimmel, 1973).

At the same time that performance is being altered by physiological changes, it is also being affected by the emotional response of an adult to physiological change. Thus, physical changes often are accentuated by the emotional state they induce. As an adult becomes less confident of his own ability, he may take longer to perform familiar tasks than his physiological state alone would require. Some adults might respond to a decrease in the ability to perform

efficiently by increased motivation and determination to compensate for the loss, while others may become depressed and discouraged to the point that their performance falls far below the potential of their actual physical state (Verner and Davison, 1971:21).

The following questionnaire items were derived from this section on reaction time:

32. Speed of reaction time tends to decline with age. [True]

35. Speed of performance does not decline with age. [False]

The physiological decline of adults gave ammunition to many to believe that mental abilities and capacities also decreased.

Mental Abilities in Adult Learning

The literature on abilities and aging contains four major areas bearing on college study in the adult years: first, decline vs. growth in intellectual functioning with increasing age; second, speed vs. power as a measure of intellectual ability; third, the changing patterns of mental abilities with increasing age; and fourth, the relationship between education and intellectual ability.

Decline vs. growth in intellectual functioning

According to Birren (1973:151-52), the problem of the criteria of adult intelligence has been notably neglected.

Most intelligence tests and measures of intellectual ability in adults have been adapted from measures used with children or young adults. Implicit in the use of intelligence tests based on those of children is the notion that intelligence is related to school achievement. This is not a satisfactory situation, and a number of criteria might be posed against which to test the validity of our concepts and measurements of adult intelligence. Measures of intellectual function might be related to: (1) longevity; (2) occupation; (3) susceptibility to certain diseases, e.g., cardiovascular disease; (4) anatomic localization of behavior deficits associated with brain damage in later life; and (5) correlation with personality. It is also important to explore sex differences in relation to development and aging of the intellect.

Adult performance on intelligence tests calls for certain attributes, such as being motivated, persisting in the task, cooperating with the psychometrist, and certainly having some comfortable familiarity with the test items (Bischof, 1969:214).

The greatest impact of age is felt by adults in the middle years of the thirties and forties, for it is at this time that the cumulative effects of aging begin to become obvious. Consciousness of age alters an adult's expectations of himself and his future so that involvement in learning is usually modified. This may be noticeable particularly

with respect to motivation and to his measures of achievement (Verner and Davison, 1971:2).

One of the most significant problems in assessing an adult's intellectual ability is the degree to which information has been obtained from cross-sectional rather than longitudinal studies. In cross-sectional studies, people who differ in age also differ in generation. This means that any measured differences in intelligence quotient could reflect either age or generation differences, or both (Troll, 1975; Botwinick, 1973; Arenberg, 1973). Baltes and Schaie (1974) believe the reasons for generational differences in intelligence lie in the substance, method, and length of education received by different generations.

The decline in intellectual functioning with increasing age intimated by cross-sectional data (Jones and Conrad, 1933; Miles, 1955; Wechsler, 1955) has not been supported by longitudinal studies which indicate continued growth into middle age. For example, Owens (1953) published a report of a longitudinal study of age changes in mental abilities. The subjects were 127 male freshmen of 1919 who had originally taken *Army Alpha, Form 6*, as an entrance examination at Iowa State University. They were retested during 1949-1950 with the identical examination. Results obtained indicated a substantial and significant increment in test scores over the years.

In 1961, Owens (1966) retested 96 subjects first tested in 1919 and again in 1950 with the *Army Alpha*, at an average age of sixty-one. The 96 subjects represented a 75 percent sample of the 127 first retested during 1950. Results obtained indicated that the decade from age fifty through age sixty was one of relative constancy in mental ability test performances for the subjects. Contrary to expectation, aging did not seem to have increased either individual or trait differences among the testees of 1961. Clearly, however, major components of the pattern of living of these subjects have served as moderators of the relationship between age and mental ability.

Bayley and Oden (1955) conducted a study in which a test designed to measure superior intelligence was administered twice, about twelve years apart, to 1,103 adults. Of these, 768 were selected as children by Terman for inclusion in the Stanford Study of Gifted Children. The other 335 were spouses of subjects in the Terman study. There was a highly significant increase in scores at the second testing both by the subjects of the gifted study and by the husbands and wives. The retests of this large group of superior adults gave strong evidence that intelligence of the type tested by the concept mastery scale continues at least through fifty years of age.

In 1956, Warner Schaie launched a major project to resolve the discrepancy between cross-sectional and

longitudinal studies. Five hundred subjects, ranging in age from twenty-one to seventy, received two intelligence tests: Thurstone and Thurstone's *Primary Mental Abilities*, and Schaie's *Test of Behavioral Rigidity*. Seven years later, Schaie and Baltes retested 301 of the subjects with the same tests. The tests they used yielded thirteen separate measures of cognitive functioning. Using factor-analysis methods, they found that the scores reflected four general, fairly independent dimensions of intelligence: (1) crystallized intelligence, (2) cognitive flexibility, (3) visuomotor flexibility, and (4) visualization. When the data were analyzed cross-sectionally, the conventional pattern of early, systematic decline was evident, but when the data were analyzed longitudinally, there was a definite decline on only one of the four measures—visuomotor flexibility.

There is no strong age-related change in cognitive flexibility. For the most important dimension, crystallized intelligence, and for visualization as well, there is a systematic *increase* in scores for the various age groups, right into old age. Even people over seventy improved from the first testing to the second.

Terminal drop.—Klaus and Ruth Riegel, psychologists at the University of Michigan, have recently suggested that when intellectual decline does occur it comes shortly before death. In 1956, the Riegels gave intelligence tests to 380

German men and women between the ages of fifty-five and seventy-five. Five years later they retested 202 of them. Some of the remaining had died, and others refused to be retested. When the Riegels looked back at the 1956 test scores of the subjects who had died, they discovered, on the average, that the deceased subjects had scored lower than those who survived.

The Riegels followed up their study in 1966 by inquiring into the fate of the people retested in 1961. Again, some people had died in the interim, and those who had died had had lower scores than those who had lived. Furthermore, people who had died since 1961 had declined in scores from the first test session in 1956 to the second in 1961. These results pointed to a sudden deterioration during the five or fewer years immediately prior to natural death, or what the Riegels called a "terminal drop."

The Riegels' results may offer an alternative explanation for the general decline found by cross-sectional studies: the older groups may contain a higher percentage of people in the terminal drop stage, and their lower scores would not be typical of the older people (Baltes and Schaie, 1974).

The following questionnaire items were derived from this section on decline vs. growth in intellectual functioning.

38. Age in itself does little to affect an individual's power to learn or to think. [True]

46. The natural course of aging does not include cognitive decline. [True]

47. Motivation of the adult taking a test is a major factor in performance. [True]

49. The most critical years in the aging process occur between the 50th and 70th years. [False]

Thorndike's study.—Thorndike *et al.* (1928) conducted comprehensive studies of adult learning to report the facts concerning changes in the amount and changes in the nature of the ability to learn from about age fifteen to about age forty-five, and especially from age twenty-five to age forty-five. They carried on three extensive series of experiments, each including two hundred or more learners and covering long periods of learning. The first concerned learning to read, write, and compute, covering a range of intellect from near the average to very low levels. The second concerned learning of typical high school subjects such as algebra, English, civics, and biology, covering a range of from near average to very high levels. The third concerned learning typewriting and stenography, covering a range of intellect from near the average to very high levels. Intensive experiments in learning to write with the wrong hand, to typewrite, and to understand the artificial language Esperanto were also conducted.

The results of these experiments are as follows:

1. On the average, at the present time, individuals probably learn much less per year from age twenty-five to forty-five than they did from age five to twenty-five.

2. The decline from the acme of ability to learn (located probably between ages twenty and twenty-five) to about forty-two is only about 13 to 15 percent for a representative group of abilities.

3. The influence of the intellect upon the curve of ability to learn in relation to age is slight.

The curve of ability to learn in relation to age from age five to forty-five is shown in Figure 2. Based on their data, Thorndike *et al.* made the following points:

1. In general, nobody under forty-five should restrain himself from trying to learn anything because of a belief or fear that he is too old to be able to learn.

2. Age, in itself, is a minor factor in either success or failure. Capacity, interest, energy, and time are the essentials.

Thus, in their use of the concept of amount per hour, Thorndike *et al.* clearly distinguish between learning rate as efficiency or as performance and learning ability as power or potential.

The following questionnaire items were derived from this section on Thorndike's study:

40. Compared to youth, adults usually require a longer time to perform learning tasks. [True]

45. Age influences the speed of learning. [True]

Speed vs. power.—Lorge (1963) indicates that a problem stemming from the Thorndike curve is that it is

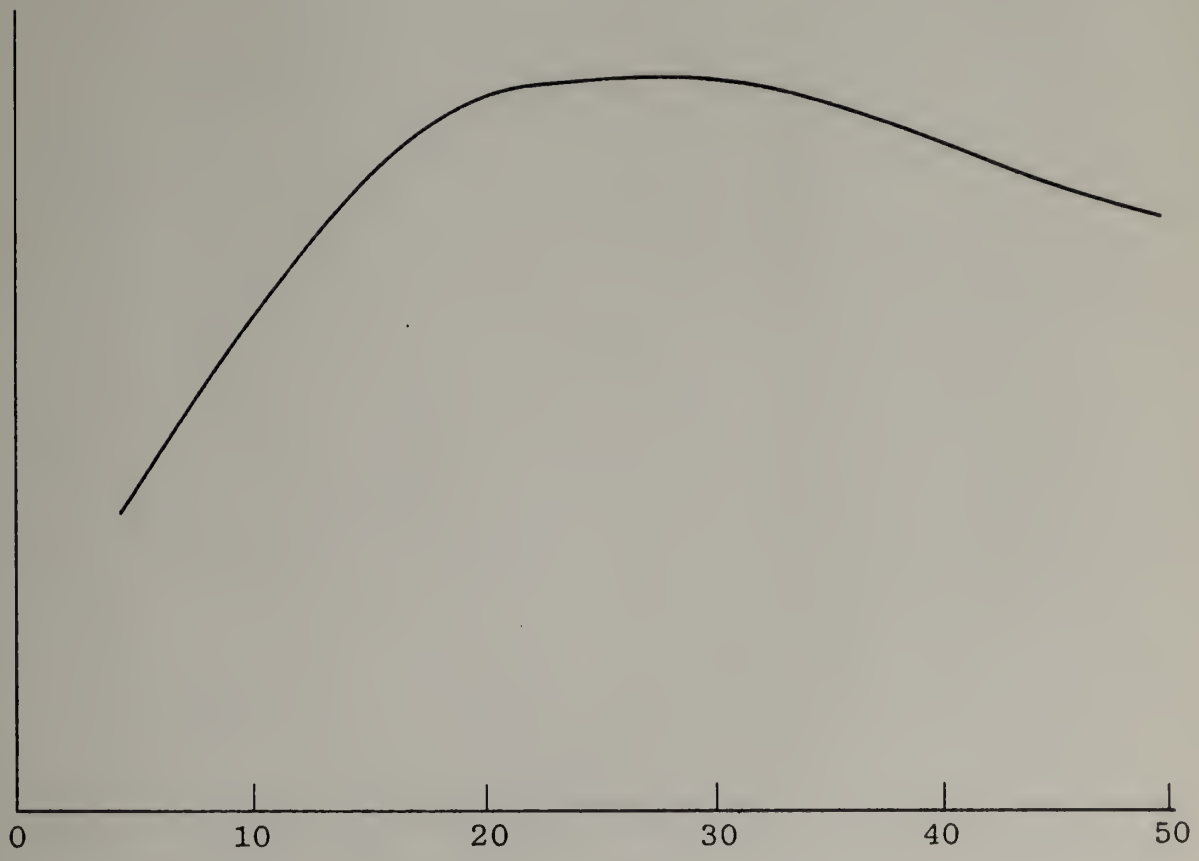

Figure 2

The General Form of the Curve of Ability to Learn in Relation to Age

based upon tests that stress and emphasize speed of response. If decrements in speed, in seeing, and in hearing do characterize aging, then the evaluation of learning ability and of intelligence must consider the abilities as abilities and not in terms of losses in performance.

In order to determine the relationship between age and various tests of mental ability, Lorge (1936) administered tests to a group of 143 adults ranging in age from twenty through seventy. He gave five intelligence tests, all timed, and the *Institute of Educational Research Intelligence Scale CAVD*, a test of intellectual power with no time limitations. On the timed tests the scores declined as the age of the group advanced. The average scores of the two older groups were, respectively, 15 to 25 percent below those of the youngest. On the *CAVD*, the scores were almost identical, with less than 0.1 percent difference between the group twenty to twenty-five years old and the two older groups, which were equal.

In the conclusion to this study, Lorge maintained that contaminating power with speed measurements among older subjects obscures the true relationship of intellectual power to age; the inference of mental decline is an unfortunate libel upon adults.

Work by Canestrari (1963), Arenberg (1965), and Eisdorfer (1965) supports the hypothesis that the aged show decreased deficit in learning ability when such noncognitive

factors as speed and anxiety are reduced or eliminated. Their subjects did not learn as well as younger age groups, but the quality of their performance increased significantly (Jarvik, Eisdorfer, and Blum, 1973:61).

Pattern of mental abilities.—As better intelligence tests became available, researchers began to realize that different intellectual measures might show different rates of decline (Birren, 1964; Arenberg, 1973; Jarvik, Eisdorfer, and Blum, 1973; Botwinick, 1973).

Eichorn (1973), reporting on subtest results from the *Wechsler-Bellevue* and the *WAIS* administered to members in the Berkeley Growth Study, found that the subtests which "hold up" are "Vocabulary" and "Information." Both subtests showed gains in both sexes through age thirty-six.

Other studies (Bilash and Zubek, 1960; Owens, 1966; Foulds and Raven, 1948) reported that scores in perceptual and dexterity tests declined from the teens to the seventies, whereas other test scores—i.e., verbal fluency and comprehension—held up until the mid-forties. Honzik and Macfarlane (1973) reported that decline in speed on motor tasks begins between the ages of eighteen and forty, at a time when verbal scores are still increasing.

Since verbal abilities do not appear to decline with advancing age, one might expect little decline in the ability to receive verbal information. Rossiter (1970) conducted an

interesting study to determine the relationship of listening ability and chronological age. The subjects in the study were thirty female upper-level undergraduate and graduate students at Ohio University during 1968. The ages ranged from twenty to sixty years. The significant negative linear relationship found between age and listening scores indicated that listening ability does decline with increased aging. The author concludes that those teaching classes in which adult students may vary widely in age might be aware that older students may be retaining less from oral presentations or information than younger students.

Sharon (1971) suggests that the relative amount of knowledge in different academic subjects changes as a function of age. There is a progressive improvement in achievement in humanities, social science, and history, and a general decline in mathematics and the natural sciences.

Botwinick (1973:185) reports that this classic aging pattern of verbal and performance scores has been demonstrated many times and now constitutes one of the best replicated results in the literature.

The following questionnaire items were derived from this section on the pattern of mental abilities:

37. The pattern of mental abilities does not change with age. [False]

39. Scores on tests such as vocabulary show increases with age. [True]

41. Scores on tests measuring perception and dexterity show no decline with age. [False]

43. Older students retain as much information from oral presentations as younger students. [False]

44. Older students have a quantitative disadvantage when compared to younger students. [True]

50. Decline in speeded motor tasks begins between the ages of 18 and 40 years. [True]

Education and mental ability.—It has become apparent that many of the observed age differences in performance on learning tasks result from cohort differences—from differences in experience and education (Woodruff and Walsh, 1975). Sorenson (1930) sought to test the theory that inactivity in learning, rather than age, is related to the lower learning ability of some older adults. His results indicated that there was no decline in learning ability in his sample for those who had recently taken course work. There was, however, a slight decline in learning ability with age for those who had not recently participated in course work.

More recently, Knox and Sjogren (1965) and Sjogren, Knox, and Grotelueschen (1968) consistently found that level of education and recency of participation in an educational activity were related to an adult's ability to learn. The advantage of the recent participant over the nonrecent participant was interpreted to be a function of both the recent

participant's broader background knowledge and his "knowing how to learn." The occupation of the individual also appears to influence his specific learning abilities. People learn from what they do, acquiring new knowledge and skills from their work (Dickinson, 1973:27-28).

Verhage found that individuals who test higher to begin with tend to maintain their level of performance longer than those who test lower (Troll, 1975:34).

It seems clear that the aged have considerable intellectual potential and ability to learn and benefit from education. The well-known productivity, high-level mental functioning, and creative output of many elderly individuals who remain active and involved in new learning experiences suggest that educational stimulation may accomplish this for many others. Almost certainly, however, we may anticipate, on the basis of available evidence, that education can play a significant role in enabling the aged to maintain their intellectual effectiveness (Granick and Friedman, 1973:61).

The following questionnaire items were derived from this section on education and mental ability:

36. Adult learning ability is influenced by the amount of formal education received. [True]

42. An adult's ability to learn is influenced by his occupation. [True]

48. Recency of participation in an educational activity is related to an adult's ability to learn. [True]

Psychological Factors in the Adult Learner

In addition to physiological changes, changes in learning patterns, reaction time, and mental abilities, there is also a difference in the personality of the adult learner. This section will focus on the change in adulthood in the following areas: developmental tasks, concept of time, interest, motivation, and self-concept.

It is only in the very recent past that we have come to study adults and adulthood as a developmental period in itself—a time during which biological maturation, accumulated experience, and formative learning serve to shape an age group which is qualitatively distinct from childhood, adolescence, or extreme old age (Huberman, 1974). This view is prevalent throughout the research in adult education (Brunner, 1959; Kidd, 1973; Knowles, 1974; Gould, 1975). As Havighurst (1956:1) concludes, "People do not launch themselves into adulthood with the momentum of their childhood and simply coast along to old age . . . adulthood has its transition points and its crises. . . . It is a developmental period in almost as complete a sense as childhood and adolescence are developmental periods.

The tasks an individual must learn—the developmental tasks of life—are those things that constitute healthy and satisfactory growth in our society. A developmental task is a task which arises at or about a certain period in the life

of the individual, successful achievement of which leads to his happiness and to success with later tasks, while failure leads to difficulty with later tasks (Havighurst, 1972:2).

Whereas the developmental tasks of youth tend to be the products of physiological and mental maturation, those of the adult years are the products primarily of the evolution of social roles. Havighurst (1972) divides the adult years into three phases—early adulthood, middle age, and later maturity. According to Havighurst, the requirements for performing each of these social roles change, as we move through the three phases of adult life, thereby setting up changing developmental tasks and, therefore, changing readiness to learn.

The following illustrates the changes in developmental tasks during the three periods of adult life:

Early adulthood (ages 18 to 30):

—Selecting a mate
—Learning to live with a marriage partner
—Starting a family
—Rearing children
—Managing a home
—Getting started in an occupation
—Taking on civic responsibility
—Finding a congenial social group

Middle age (ages 30 to 55):

—Achieving adult civic and social responsibility
—Establishing and maintaining an economic standard of living
—Assisting teen-age children to become responsible and happy adults
—Developing adult leisure-time activities
—Relating to one's spouse as a person

—Accepting and adjusting to the physiological changes of middle age
—Adjusting to aging parents

Later maturity (55 and over):

—Adjusting to decreasing physical strength and health
—Adjusting to retirement and reduced income
—Adjusting to the death of a spouse
—Establishing an explicit affiliation with one's age group
—Meeting social and civic obligations
—Establishing satisfactory physical living arrangements

The following questionnaire items were derived from this section on psychological factors in the adult learner:

57. Adulthood is not a developmental period in itself. [False]

59. Developmental tasks of the adult years are related to the evolution of social roles. [True]

61. The concept of developmental tasks provides a way of identifying the educational needs of adults. [True]

With the exception of Havighurst (1956), Erikson (1950), Buhler (1935), and Kohlberg (1973), dynamic theories of personality have not been concerned with the problems of change in adulthood, although people such as Fromm (1941), Maslow (1954), and Jung (1933) have indicated the profound behavioral changes which may occur in adulthood.

Neugarten (1964, 1968) sees the adult personality as continuous but not identical with the personality of the child and the adolescent. She indicates the heightened importance of introspection in the mental life of middle-aged persons—the stock-taking, the increased reflection, and,

above all, the structuring and restructuring of experience. There is also a general movement of energy from an outer-world to an inner-world orientation. Thus, while it is not true that life begins at forty, it seems indeed to be true that life is different after forty.

Charlotte Buhler (1935) and her student Else Frenkel-Brunswik, from studies of four hundred biographies, proposed five stages of life that correspond to the biological phases of life. They suggested that life continues from premarriage (age 0 to 15) to preparatory expansion (age 15 to 25), to culmination and goal determination (age 25 to 45), to self-assessment (age 45 to 65), and to fulfillment or failure (age 65 and older). The key elements in this approach to the life-span concept are the turning points which usher in permanent changes marking a basic transposition in development. In general, at around forty-five years of age a change takes place in that the needs which come from the biological nature of man become less important, and the duties directed by our ideals or laid down by authority and practical demands play a more dominant role. The authors call this a transfer of dominance from the field of biological need to the field of personal and social duties.

In looking at personality, Jung (1971) was interested in problems of the psyche. He indicates that in the second half of life the individual turns inward, and that this inner

exploration may enable him to find a meaning and wholeness in his life that makes it possible to accept death.

Erikson (1950) delineated the life cycle and personality into eight stages, each stage being characterized by a choice or crisis for the ego. The last three stages of his model deal with the development of intimacy in early adulthood, the crisis of generativity in middle adulthood, and the crisis of ego integrity in late adulthood.

These theorists have contributed toward a theoretical framework for the recent attention being given to the mid-life period in adult development.

For example, Lowenthal (1975), in her study of adult life stages, presents an analysis of the sociopsychological factors of the transitions of adult life. Her subjects were women and men at four stages of life: high school seniors, young newlyweds, middle-aged parents, and an older preretirement group from the middle and lower middle class. The fieldwork consisted of a focused interview and several structured instruments, including the *WAIS* Vocabulary and Block Design subtests and the Thematic Apperception Cards.

One of the most interesting findings of the study was the marked sex differences through the various stages. Some of these differences follow:

1. Marital dissatisfaction was greatest among middle-aged women.

2. A stronger and more positive self-image existed among men than among women.

3. Middle-aged women appeared considerably more stressed than did middle-aged men.

4. On nearly all counts, middle-aged women confronting the postparental period were more clearly in a critical period than were their male counterparts.

An awareness of the psychological theories and needs in the life cycle are an important focus of those working with adults. To be apprised of the developmental stages, turning points, issues, and crises of adulthood will greatly enhance one's effectiveness in dealing with the adult learner.

Time

One of the processes that occurs in the middle years of life which promotes change in personality is the re-evaluation of time and the formulation of new perceptions of time and death (Neugarten, 1963:71).

The psychology of adults is distinguished from the psychology of earlier years in the experience of time. The major events of life can be expected to occur in the plus or minus five decades of adult life. To be aware that one is behind, on, or ahead of schedule of life expectations can have a profound effect on life adjustment. Lewin says that to the child the future is vague but just ahead, to the adolescent vague but unlimited; the adult, however, has a

realistic attitude toward time which sharply differentiates his perspective from the outlook of youth (McClusky, 1963: 18).

Neugarten (1963:68) believes that there comes a point, usually in the middle years, when the individual realizes that time is not infinite, and that the self will die. Along with this realization may come, also, an end to measuring one's lifetime from the date of one's birth, and measuring it, instead, from the distance from one's death.

Pressey and Kuhlen (1957:303-4) indicate that the perception of sublimits of time within the total life span may also influence the perspectives of adults. Some sublimits may be biologically determined. For example, time is a crucial matter for the woman who marries late and wants children, or for the professional athlete seeking wealth before he is too old. Other sublimits are culturally determined, such as the time limit felt by the clerk of thirty-five who desires to be an executive.

Another phenomenon of the adult years is the universal experience that time seems to pass faster as one grows older. For a youngster of six, one year is one-sixth of all the time he has known. For a youth of sixteen, a year is one-sixteenth of his years. For a man of forty, a year is one-fortieth of life, and at seventy, merely one seventieth of the years lived (McClusky, 1963:18).

Wallach and Green (1961), in an experiment using 278 older and younger adults of both sexes, demonstrated that older persons consider swift metaphors more appropriate for describing time, while young adults consider static metaphors more appropriate. This finding suggests that the subjective speed of time is more directly influenced by the value of time than by a person's level of activity as such, for, while activity level decreases in old age, the value of time seems to increase.

According to Kidd (1973:48), for an adult the investment of time in an activity may be as important a decision as the investment of money or effort.

Pressey and Kuhlen (1957:304) believe that sensitivity to the time variable may be one of the most distinctive features in the psychology of the adult years.

The following questionnaire items were derived from this section on time:

56. The adult has a less realistic attitude toward time than youth. [False]

63. A phenomenon of the adult years is the universal experience that time seems to pass faster as one grows older. [True]

Motivation

Kidd (1959:116) feels that time has a key influence on motivation. The adolescent has all the time in the world ahead of him; nothing seems impossible to do. But the woman of forty-five, the man at fifty, now realize that it may

already be too late for the expression of some deeply felt needs, and that all future objectives will depend upon how much time is left for their expression. The intensity of motives may deepen or lessen; a man may be determined to finish some task before it is too late, or he may become resigned to the likelihood that it will never be finished.

Among middle-class Americans, for example, career drives are likely to take precedence over many other psychological needs and dominate the years of young adulthood, perhaps even to the point of resulting in minimal contact with family. If by forty or forty-five the career-oriented individual has achieved economic security and success, the need to get ahead may be much less in evidence and the former career-oriented individual may turn to his family or to community activities as a source of gratification (Kuhlen, 1963: 78-79).

While motivation is extremely complex and imperfectly understood, it is best seen within the framework of an adult's needs, goals, habits, values, and self-concept. Thus, an adult's willingness to engage in learning depends upon such factors as his perception of the value of learning, his acceptance of what and how to learn, his need for self-esteem or social affiliation with others, and expectations from life (Verner and Davison, 1971:4).

There are many different notions about motivation and its influence upon learning. From all of them, it seems

clear that intrinsic motivation is far more important than extrinsic, especially when dealing with adults (Verner and Davison, 1971:4-5).

Life experience

In general, adult learners enter a learning situation with a high degree of readiness to learn, but the adult wants answers that will relate directly to his life. The chances are that he will equate them to his life experiences. He makes qualitative judgments and he uses his life experiences to make new considerations. If he sees that he can gain relevant knowledge from activities in adult education, he will participate. If not, he will drop out. The fact that the adult learner is different makes the understanding of what Havighurst calls the "teachable moment" so important. That moment comes when a person has need for a skill or knowledge which will help him solve a life problem (Axford, 1969:77).

Jensen (1963:21-22) contends that adult students are not always interested in maximizing their learning or becoming totally involved in each instructional situation in which they take part. Rather, they are inclined to distribute their energies and involvement according to the kind and amounts of learning they feel would be most beneficial to them in the immediate and for the future.

Gardner Murphy (1955) contends that the adult has not fewer but more emotional associations with factual

material (than do children), although we usually assume he has less because the devices of control are more elaborate and better covered in the adult. This emotional association with words or events may affect the adult in gaining new knowledge.

Jacob Getzels (1956) indicates that adults learn best the things that are in keeping with their value systems and their personal biases. In a review of recent experiments in learning and learning theory, Getzel shows that the adult learns best those things where he sees relationships that are relevant to him. A summary of some of the conditions most often present in adult learning situations follows:

FOUR CONDITIONS USUALLY PRESENT IN ADULT LEARNING SITUATIONS

1—Most of the significant problems faced by the adult do not have correct answers in any ultimately verifiable sense. The important decisions are always made in the face of uncertainty.

2—There are stereotyped institutional solutions that are correct because they are traditional rather than rational. The adult, more than the child, is bound by these stereotyped solutions and, although the solutions are modifiable, they are modifiable only in the face of severe internal and external pressures.

3—Any solution the adult makes to a problem is bound to have significant effects upon other individuals. He must predict not only his own reactions but the reactions of others.

4—The solutions to problems inevitably involve more than the assessment of objective facts. Perceptions and decisions may appear incorrect in the light of reality, but they are made because of emotional factors. By the time the adult comes to a learning problem, he is usually in one way or another deeply committed to a particular point of view regarding the significant matters at issue.

The following questionnaire items were derived from these sections on motivation and life experience:

60. In teaching adults extrinsic motivation is more important than intrinsic motivation. [False]

62. Emotional association with words or events may affect the adult in gaining new knowledge. [True]

65. Adult learners enter a learning situation with a high readiness to learn. [True]

Participation

Another aspect of the relationship between learning and motives can be seen in the reasons adults attend programs. In an in-depth study of twenty-two cases of participants in adult education activities, Cyril O. Houle investigated their purposes and objectives. Houle classifies the continuing learner as: (1) goal-oriented (those pursuing their education as a means of accomplishing fairly clear-cut objectives), (2) the activity-oriented (those who take part in learning for reasons unrelated to education, perhaps out of loneliness, or a need for social activity), and (3) learning-oriented (those seeking "learning for learning's sake") (Houle, 1961:15-25).

Since Houle's work, many other studies (Sheffield, 1964; Burgess, 1971; and Boshier, 1971) have tried to assess the importance of reasons for adult participation in educational activities. For example, Burgess (1971), with his instrument "Reasons for Educational Participation,"

identified the following seven groups of reasons for adult participation:

The Desire to Know;
The Desire to Reach a Personal Goal;
The Desire to Reach a Social Goal;
The Desire to Reach a Religious Goal;
The Desire to Escape;
The Desire to Take Part in Activity; and
The Desire to Comply with Formal Requirements.

Self-concept

According to Jensen (1963:23), when adults do participate in educational activities they are especially concerned with maintaining and enhancing their social worth and success. Adults have a strong need for the acquisition of new knowledge and skills in an instructional situation in which there is no danger of losing "hard-won" prestige.

Warren (1961) contends that adults, even more than children, are sensitive to failure in their learning situation, and that previous unfavorable experiences with education may cause fears and self-doubts about ability (Comfort, 1974).

Tuckman and Lorge (1953) conducted a study to investigate the attitudes of a young adult group of graduate students toward old age as measured by their responses to a questionnaire consisting of misconceptions and stereotypes about old people.

The questionnaire was administered to 147 graduate students (92 men and 55 women) enrolled in a course on the "Psychology of the Adult at Teachers College."

This study indicated that there was a substantial acceptance of the misconceptions and stereotypes about old people. Table 4 indicates the mean score (the number of "yes" responses) and the standard deviation, by sex and age. The responses indicated that these graduate students look upon old age as a period characterized by economic insecurity, poor health, loneliness, resistance to change, and failing physical and mental powers.

Tuckman and Lorge conclude that from the results it appears that old people are living in a social climate which is not conducive to feelings of adequacy, usefulness, security, and to good adjustment in their later years.

If these concepts are subsumed by the adult learner, the fear of aging, rather than the aging process itself, may induce mental deterioration (Horvath, 1952).

George Aker (1971:55) contends that adults are more bound to their stereotypes than are children. This follows through with almost every attitude, belief, and set of values of an adult. He's tied to them more. It is more difficult to set them aside for awhile and entertain some conflicting, opposing points of view.

Zahn (1967) indicates that the way in which a person organizes his perceptions, as well as what he selects to

Table 4

Mean Scores and Standard Deviations on Old People Questionnaire by Age and Sex

Variable	N	Mean	S.D.
Age group:			
20-29 years	69	58.79	21.71
30-51 years	78	58.16	23.60
Sex:			
Male	92	57.68	21.50
Female	55	59.64	24.86

perceive, is influenced by what he expects; and what he expects depends on his experience and his motives. It is more difficult to change the perceptions of an adult than of a child because the adult has had more prior experience.

Adults have different values, interests, and personality traits than youth has, and their concerns and dispositions tend to be more stable (Zahn, 1967). Studies by Strong (1953), Thorndike (1935), and others indicate the following changes in adult interests:

1. Activities requiring physical skill and daring decrease in liking as one ages.

2. With few exceptions, liking for occupations decreases with age.

3. Interests can be modified.

4. Slight decrease in the total volume of interest from the twenties to the fifties.

The following questionnaire items were derived from this section on self-concept:

51. Adults are often inhibited from active participation in discussion by a lack of confidence in their own ability. [True]

52. Frequently the fear of aging, rather than the aging process itself induces mental deterioration. [True]

53. Adults even more than children are sensitive to failure in their learning situation.

54. Adults rarely hold the opinion that they are unable to learn. [False]

55. Adults are concerned with maintaining and enhancing their social worth and success. [True]

58. Once the adult has formed a perception of a stimulus it is difficult for him to change his mind. [True]

64. With few exceptions liking for occupations increases with age. [False]

In conclusion, change and consistency in adult personality constitute a problem area that thus far has attracted relatively few psychologists; nevertheless, evidence is beginning to accumulate that systematic and measurable changes occur in the second half of life (Neugarten, 1968). Adults change through the years in their sense of time, their career pattern, their physiological condition, and their complex of interests and motivations. An adult psychology is a necessity for continuing education (Huberman, 1974).

Having reviewed some of these changes that have occurred throughout adulthood, an exploration into how these differences will affect an adult's orientation to learning will follow.

Orientation of the Adult Learner

In this section the following areas will be discussed: andragogy, experience, adult learning orientation, and implications for the adult teacher.

According to Malcolm Knowles (1970), most of what is known about learning has been derived from studies of learning in children and animals. Most of what is known about teaching has been derived from experience with teaching children under compulsory attendance. Birren and Woodruff

(1973) feel that teachers who are currently employed, as well as those now being trained, are not prepared to teach middle-aged and aged adults, and they are not being provided with appropriate information about the biological, psychological, and sociological aspects of life-span development.

When adult education began to emerge as a field of social practice, it simply borrowed the assumptions and strategies of pedagogy. But when a falling retention rate in adult classes was noted, teachers began experimenting with different assumptions and strategies, and there began to emerge a body of literature describing successful teachers of adults.

In the early 1960's, European adult educators, especially in France, Germany, Yugoslavia, and the Netherlands, started using the label "andragogy" to identify this increasingly differentiated body of theory and technology of adult learning which gave credence to the differing learning orientations of children and adults. The connotation given to his new label was "the art and science of helping adults learn."

The basic differences in assumptions and strategies between pedagogy and andragogy can be seen in Table 5 (Knowles, 1974).

The following questionnaire items were derived from this section on orientation of the adult learner:

Table 5

A Comparison of Assumptions and Processes of Pedagogy and Andragogy

Assumption			Process Elements		
About	Pedagogy	Andragogy	Element	Pedagogy	Andragogy
Self-concept	Dependency	Increasing self-directiveness	Climate	Authority-oriented Formal Competitive	Mutuality Respectful Collaborative Informal
Experience	Of little worth	Learners are a rich resource for learning	Planning	By teacher	Mechanism for mutual planning
Readiness	Biological development Social pressure	Developmental tasks of social roles	Diagnosis of needs	By teacher	Mutual self-diagnosis
Time perspective	Postponed application	Immediacy of application	Formulation of objectives	By teacher	Mutual negotiation
Orientation to learning	Subject centered	Problem centered	Design	Logic of subject matter	Sequenced in terms of readiness
				Content units	Problem units
			Activities	Transmittal techniques	Experiential techniques (inquiry)
			Evaluation	By teacher	Mutual rediagnosis of needs
					Mutual measurement of program

11. Andragogy is the art and science of helping adults learn. [True]

20. Adults and children have the same orientation to learning. [False]

Experience

Having lived longer and having a greater apperceptive mass of past experiences, adults are not only much more complex than children, but they are also more differentiated and less dependent on immediate influences of the environment (Huberman, 1974).

Kidd (1973:45-46) indicates three basic ways in which adulthood differs from youth in the human life cycle: (1) adults have *more* experiences; (2) adults have *different kinds* of experiences; and (3) the life experiences of adults are *organized* differently.

An adult's sexual or social experiences are of a kind that mark him off from the world of children. The same can be said for experiences of a job, or politics, or war. But this point has not always been understood or accepted (Kidd, 1959:45).

An adult brings to learning situations a tremendous range of stored learnings—the accumulations from experiences in everyday living. These are most useful resources for learning (Lorge, 1963; Hendrickson, 1970).

Conversely, in the case of many adults, especially older ones, long experience will cause them to be set in

their ways and resentful of change (Hendrickson, 1970). According to Zahn (1967), the greater experience a person has had, the more the past probably will interfere with the present. It is easier for an experienced person to learn a completely new task than to learn to do a familiar task in a new way.

The more the teacher of adults can base his/her teaching upon previous experience, the better and faster the adult will learn. The teacher should urge the adult to relate new or difficult concepts to his own experience and to use the past to help himself with the present and the future (Zahn, 1967; Whipple, 1957).

The following questionnaire items were derived from this section on experience:

6. Adult students should be encouraged to relate new or difficult concepts to their existing knowledge. [True]

9. It is difficult for an adult to do a familiar task in an unfamiliar way. [True]

10. An adult's experience is an increasing resource of learning. [True]

14. An adult's experience may interfere with the learning process. [True]

Learning orientation

Adults, even more than children, bring attitudes with them into the learning situation that markedly affect their ability to learn or their motivation. Those adults with strong feelings of powerlessness will fail to learn

control relevant information. Adults will be more motivated to listen and to read content which may increase their competence in a current situation (Zahn, 1969).

Comfort (1974) indicates that adult learners want educational experiences or knowledge which is related to job/life situations. He further contends that adults are more interested in applied knowledge than in theory, and they enter into a learning situation in a problem-centered frame of mind.

One of the assumptions of andragogy is that the adult's time perspective changes from one of postponed application of knowledge to immediacy of application, and accordingly his orientation toward learning shifts from one of subject-centeredness (the traditional seven subjects of youth education) to one of problem-centeredness (Knowles, 1970).

This change in orientation supports Jensen's (1963) contention that adult students are not always interested in maximizing their learning or becoming "totally" involved in each instructional situation in which they take part. Rather, they are inclined to distribute their energy and involvement according to the kind and amounts of learning they feel would be most beneficial immediately and for the future. He also feels that adult students should be able to influence their own learning goals as a means of making certain that these goals take account of their needs and problems. Since the

adult has compelling responsibilities competing for his time and attention, many adults desire minimum time expenditures to complete their educational objectives (Comfort, 1974).

From a series of studies conducted at the Ontario Institute for Studies in Education, Tough (1971:1) and his associates discovered that it is common for an adult to spend seven hundred hours a year at learning projects, and about 70 percent of all learning projects are planned by the learner himself. Hiemstra (1976:33) states that many educators are beginning to pay attention not only to the uniqueness of the adult learner, but also to the tremendous interest in and need for self-directed, individual learning.

The following questionnaire items were derived from this section on learning orientation:

8. Adult learners are often problem centered rather than subject centered. [True]

12. Adult learners want educational experiences which relate to job/life situations. [True]

15. Adult students should be involved in formulating their learning objectives. [True]

16. Adult learners desire minimum time expenditures to complete their educational objectives. [True]

In an article on adult learning and modification of attitudes, Andersen (1969) comments that adults learn more effectively and quickly in a noncompetitive atmosphere where they can cooperate with others and use their experience to foster learning. Ross (1968), in a study on the "Effects of Challenging and Supportive Instructions on Verbal Learning

in Older Adults," gave sixty young and sixty old subjects two paired-associate learning tasks differing in level of difficulty under neutral, supportive, and challenging instruction. Older subjects revealed a greater performance decrement on the more difficult task than did the younger group. Elderly subjects did least well on the acquisition phase of learning under challenging instructions and best under the supportive treatment. Ross concluded that the increasing insecurity and susceptibility to stress of aging individuals become particularly evident when they are placed in an evaluative situation and told that their performance will be compared with that of others.

Haines and McKeachie (1967) found that required competition was a potent factor in raising anxiety levels. They also found that, when compounded by the learner's existing anxiety level, the tension created by class competition, especially under a competitive grading system, resulted in an undesirable situation. According to Knowles (1970), nothing makes an adult feel more childlike than being judged by another adult; it is the ultimate sign of disrespect and dependency, as the one who is being judged experiences it. He feels evaluation should be a mutual undertaking, as are all other phases of the adult learning experience.

Woodruff and Walsh (1975) indicate that for older adults the threat of evaluation, such as objective tests graded on a competitive basis, probably should be avoided.

Pankowski (1975) comments that teachers of adults should work with them in developing mutually acceptable criteria and methods for measuring progress; helping the learner to develop and apply procedures for self-assessment according to these criteria. Involving the learner in selecting objectives enhances motivation and learning. Specific objectives are stated in measurable terms: (1) to assess the learning outcome that is sought, so the teacher can help effectively design the instruction; and (2) to facilitate measuring learning outcomes—whatever capability of the learner can't be specified in observable human performance, can't be measured.

According to Larson (1970), too few teachers know enough about the adult learner's anxiety level. Many adults come to their classes with a good deal of insecurity and anxiety about their ability to succeed in a new learning situation (Larson, 1970; Pankowski, 1975; Basowitz and Korchin, 1957). Many adult students feel they do not possess the necessary study skills (Comfort, 1974). In a study of the characteristics and educational needs of adult undergraduate students at the University of Oklahoma (Barney, 1972), some of the most frequent "suggestions" were refresher courses and help in learning how to study. Jensen (1965) contends that the learning tasks designed for adults must be commensurate with the study skills they possess so as not to

confront them with a situation in which a loss of personal esteem is likely to result.

Hendrickson (1970) feels that coming from a world of work where mistakes are costly, most adults have higher standards of performance than do children or youth; therefore, they have a strong need for the acquisition of knowledges and skills in an instructional situation in which there is no danger of losing "hard-won" prestige (Jensen, 1965; Glass and Harshberger, 1974).

Knox (1974) reports that adults learn more effectively when they receive feedback regarding how well they are progressing. Punishment and threatening instructions slow up the learning process in adults much more than in children (Andersen, 1969; Lorge, 1965; Dickinson, 1973; Knox, 1974).

One of the basic principles of adult learning is that students should be able to learn at their own pace. By far the most constant modification in behavior noted with advancing age is a decline in performance on speeded tasks (Birren, 1964, 1970). For example, Eisdorfer, Axelrod, and Wilkie (1963) established that when the time to respond is increased in serial learning the old benefit more than the young. The same effect has been found in paired-associate studies. Canestrari (1963) reported that paired-associate performance of the old improved more than that of the young when the pace was slowed (Arenberg, 1973).

Adults typically learn most effectively when they set their own pace and take a break periodically. If an adult is forced to proceed much slower or faster than his preferred pace, his learning effectiveness declines (Knox, 1974).

Belbin (1953) conducted a study into difficulties that older people experienced in thirty-two factories. Where work was subject to time stress (when tempo of work was maintained by rigid pacing or time pressure), there was some tendency both for men and women to move away from operations requiring continuous body movement and activity, especially where the worker was paced by a machine or conveyor.

The following questionnaire items were derived from this section on learning orientation:

7. In helping adults to learn, reward is more effective than punishment. [True]

13. In the adult learning process, grading rather than self-evaluation is more effective. [False]

17. Older students should not be allowed to set their own learning pace. [False]

18. Most adults have higher standards of performance than children or youth. [True]

19. Adult students often lack necessary study skills. [True]

These findings suggest that the educator can do the following to improve his educational efficiency:

1. Minimize time requirements.

2. Remove stressful evaluation techniques.

3. Allow for self-pacing.

4. Involve learners in formulating their learning objectives.

5. Base learning on the adult's prior experience.

6. Use reward.

7. Use feedback.

8. Facilitate development of study skills.

9. Involve learners in ongoing evaluation.

Summary

In Chapter II, a review of the literature on the characteristics of the adult learner was presented as a basis to support the content validity of the questionnaire used to collect data for this study.

The review was divided into four sections: (1) physiological changes in the adult learner, (2) mental abilities of the adult learner, (3) psychological factors in adult learning, and (4) orientation to learning of the adult.

CHAPTER III

PROCEDURES

This chapter describes the procedures used in the study and is divided into the following eight sections: (1) hypotheses; (2) population, (3) sample, (4) sequence of events, (5) instrumentation, (6) design of the study, (7) treatment of the data, and (8) summary of procedures.

Hypotheses

Presented below are the formulated hypotheses of the study:

Null Hypothesis 1: There are no significant differences in awareness level by age among the faculty at the five community colleges on the composite adult learner variables.

Null Hypothesis 2: There are no significant differences in awareness level by sex among the faculty at the five community colleges on the composite adult learner variables.

Null Hypothesis 3: There are no significant differences in awareness level by institutional affiliation among the faculty at the five community colleges on the composite adult learner variables.

Null Hypothesis 4: There are no significant differences in awareness level by teaching experience among the faculty at the five community colleges on the composite adult learner variables.

Null Hypothesis 5: There are no significant differences in awareness level by adult education background among the faculty at the five community colleges on the composite adult learner variables.

Population

The population in this study consisted of all full-time faculty at the following five colleges in the Maricopa County Community College District: Glendale Community College, 159 faculty; Maricopa Technical Community College, 76 faculty; Mesa Community College, 179 faculty; Phoenix College, 204 faculty; and Scottsdale Community College, 92 faculty. A current directory listing all full-time faculty was obtained from each of the five colleges in the Maricopa Community College District. The total population was 710 full-time faculty.

Sample

A random sample stratified according to sex was drawn from the population. The sample consisted of 150 full-time faculty—93 males and 57 females. Fox (1969:347) indicates that the statistical dividing line between large and small samples is a sample size of thirty. With two such samples, the curve of the *t* distribution and of the normal curve are so close as to be the same for purposes of hypothesis testing. Therefore, if we wish to have what will statistically be

considered large samples, we will want to have at least thirty in each of two samples, or sixty in one sample.

A random selection procedure using a table of random numbers was employed (Arkin and Colton, 1963).

Sequence of Events

During the spring and summer of 1976, a questionnaire was developed based on a review of the literature related to selected adult characteristics.

The questionnaire was then submitted to a panel of experts in the field of adult education. A pilot study was conducted during the first summer session of 1976.

The final form of the questionnaire (Appendix A) was mailed to the 150 full-time faculty in September 1, 1976, with an accompanying cover letter (Appendix B) explaining the purpose of the study. The questionnaires were distributed via intercampus mail, and the respondents were asked to return the questionnaires via intercampus mail to Phoenix College. To facilitate follow-up, the questionnaires were coded by putting a number ranging from 1 to 150 on the top corner of each instrument. Each number corresponded to an individual in the sample population.

On September 26, 1976, a follow-up letter (Appendix C) and a second questionnaire were sent to all faculty who had not initially responded.

During the week of October 4, 1976, personal telephone calls were made to those faculty who had not returned questionnaires.

Instrumentation

The instrument utilized in this study was a questionnaire developed by the researcher based on a review of the research in the areas of adult learner characteristics and questionnaire development. The questionnaire contained sixty-five items. The first five items were demographic in nature. Items 6 through 20 related to the orientation of the adult learner; items 21 through 35 related to the physiological changes in the adult learner; items 36 through 50 related to the mental abilities of the adult learner; and items 51 through 65 related to the psychological factors in adult learning.

The questions were grouped according to the above four categories in order to facilitate data analyses. The respondents were asked to indicate agreement or disagreement with each statement. For fifteen randomly placed statements "disagree" was the correct answer. This was intended to control for possible response set.

An essential quality of a measuring instrument is that of validity. To insure that the questionnaire had face and content validity, the following procedures were utilized:

1. *Panel of experts:* The instrument was submitted to a panel of ten experts in the fields of adult education and psychology. The following panel members include both practitioners and academicians:

Robert Anderson, Ph.D.
Director of Staff Development Project, Phoenix Union High School District, Phoenix, Arizona

Roger Axford, Ph.D.
Associate Professor of Adult Education, Arizona State University, Tempe, Arizona

Victor Baumann, Ph.D.
Professor of Psychology and Educational Foundations, Arizona State University, Tempe, Arizona

Richard Bunning, Ph.D.
Director of Employee Education, Good Samaritan Hospital, Phoenix, Arizona

John Cionca, M.A.
Director of Christian Education, Trinity Baptist Church, Mesa, Arizona

Lynn Johnston, M.A.
Director of Continuing Education, State University of New York at Brockport, Brockport, New York

Dee Lohr, M.A.
Educational Consultant, Hai & Associates, Tempe, Arizona

Mark Rossman, Ed.D.
Associate Professor of Adult Education, Arizona State University, Tempe, Arizona

Edward Scannell, M.A.
Director of Non-Credit Programs, University Extension, Arizona State University, Tempe, Arizona

Edythe Stellhorn, M.A.
Coordinator of Continuing Education, College of Nursing, Arizona State University, Tempe, Arizona

The panel was asked to comment on the following areas: (a) ambiguity of the questions, (b) content of the questions,

(c) terminology, (d) phrasing of the questions, and (e) format of the instrument. Questionnaire revisions were made based upon responses from the panel.

2. *Pilot study:* A pilot study was conducted during the first five-week summer session of 1976. The population consisted of all full-time faculty at the five community colleges in the Maricopa Community College District who were teaching during the first summer session. A list containing the names of all those teaching during the first summer session was obtained from each of the five colleges in the district. The population consisted of 242 full-time faculty.

A random sample stratified according to sex was drawn from the population. A random sampling, using a table of random numbers, was employed in the sample selection. Thirty full-time faculty members—nineteen men and eleven women—were randomly selected. The population for the pilot study approximated the population for the larger study as closely as possible. In addition to taking the questionnaire, the pilot sample was asked to do the following: (a) place an asterisk in front of any question considered vague or ambiguous; (b) indicate any ideas that might come to mind to improve the instrument.

3. *Graduate adult education classes:* In addition, two graduate classes in adult education at Arizona State University, having an enrollment of forty students, were

requested to complete the questionnaire and comment on the clarity, content, scoring, and wording of the instrument.

Comments and suggestions from the panel of experts, pilot study, and graduate adult education classes were used in the development of the final form of the questionnaire. Some of these suggestions were: (a) eliminate redundant items, (b) reduce ambiguity on certain questions, (c) avoid response set, (d) change scaling from Likert to forced-choice format, (e) change terminology of certain items, (f) use more specific facts, and (g) indicate that these are general statements.

To ascertain the reliability of the instrument, coefficient alpha (α), an index which estimates a test's internal consistency or reliability, was run. It is customary to consider a test reliable if α exceeds .85 (Stock, 1976). The alpha on the instrument used in this study equaled .90.

Design of the Study

The design of the study was a descriptive survey. Data relevant to the views of randomly selected full-time faculty at the five colleges in the Maricopa Community College District were obtained through the use of a questionnaire designed by the researcher.

Treatment of the Data

The responses were recorded on International Business Machines (IBM) general-purpose answer sheets. The data obtained were machine scanned and transferred to computer cards at the Arizona State University Computer Center.

Correct answers were assigned the numerical value of 1. Incorrect answers were assigned the numerical value of 0.

The individual response columns were totaled to provide a total score for each respondent, as well as a total score for each dependent variable.

The dependent variables were: (1) orientation of the adult learner, (2) physiological changes in the adult learner, (3) mental abilities of the adult learner, and (4) psychological factors in adult learning. This was processed utilizing the Statistical Package for the Social Sciences (Nie, Hull, Jenkins, Steinbrenner, and Bent, 1975).

The statistical technique utilized was multivariate analysis of variance (Cooley and Lohnes, 1971). The MANOVA F test was completed to determine if there were overall significant differences among the mean scores of the full-time faculty, by factor, for the four dependent variables.

The univariate F test was run to identify differences in the specific variables.

The probability for accepting or rejecting the null hypotheses was at the .05 level of significance.

Summary

In Chapter III, the procedures used in the investigation were presented.

The population reported in this study consisted of full-time faculty at the five colleges in the Maricopa Community College District.

A random sample stratified according to sex was drawn from the population. The sample consisted of 150 full-time faculty.

The instrument used in this study was a questionnaire which was developed by the researcher after it had been submitted to a panel of experts, pilot tested, and administered to classes in adult education.

The general design of the study utilized the descriptive method of research.

The statistical technique used was multivariate analysis of variance. The probability of accepting or rejecting the null hypotheses was at the .05 level of significance.

C H A P T E R I V

RESULTS

This chapter includes research findings produced by analysis of the data discussed in Chapter III. Chapter IV is divided into three sections: (1) questionnaire responses, (2) demographic information, and (3) results of the statistical treatment used to test the hypotheses.

Questionnaire Responses

A total of 150 questionnaires were distributed. Of this number, 93 were distributed to males and 57 were distributed to females. The number of usable questionnaires returned by the total group was 122, or 81.33 percent of the 150. The number returned by males was 69, or 74.19 percent, and the number returned by females was 53, or 92.98 percent, as indicated in Table 6. It is interesting to note the high number and percent of returns from the females in the population: 53, or 92.98 percent.

Table 6 indicates the distribution and return of questionnaires by the five colleges in the Maricopa Community College District. Of the 34 questionnaires distributed to Glendale Community College faculty, 24, or 70.58 percent, were returned. Of the 38 questionnaires distributed to Mesa Community College, 29, or 76.31 percent, were returned. Of the 21 questionnaires distributed to Scottsdale Community

Table 6

Distribution and Return of Questionnaires for Faculty at the Maricopa Community College District

Group	Number Distributed	Number Returned	Percent Returned
Full-time faculty	150	122	81.33
Males	93	69	74.19
Females	57	53	92.98

College faculty, 15, or 71.42 percent, were returned. Of the 38 questionnaires distributed to Phoenix College faculty, 37, or 97.36 percent, were returned. Of the 19 questionnaires distributed to Maricopa Technical Community College faculty, 17, or 89.47 percent, were returned. It is interesting to note that the random sampling of full-time faculty at the five community colleges is extremely representative of the numbers of faculty who teach in the district. The largest faculty is at Phoenix College, followed by Mesa Community College, Glendale Community College, Scottsdale Community College, and Maricopa Technical Community College, in that order. It is also noteworthy that the highest response rate came from Phoenix College, with a 97.36 percent return rate, and from Maricopa Technical Community College, with an 89.47 percent return rate. Both Phoenix College and Maricopa Technical Community College are in urban areas, as compared to Glendale Community College, Mesa Community College, and Scottsdale Community College, which are in rural or suburban areas. Table 7 is a tabular representation of the distribution and return of questionnaires, listed by colleges.

Distribution of Demographic Characteristics

Respondents were classified according to selected demographic characteristics. Respondents were asked to

Table 7

Distribution and Return of Questionnaires by Colleges

College	Number Distributed	Number Returned	Percent Returned
Glendale Community College	34	24	70.58
Mesa Community College ...	38	29	76.31
Scottsdale Community College	21	15	71.42
Phoenix College	38	37	97.36
Maricopa Technical Community College	19	17	89.47

indicate age, sex, institutional affiliation, years of teaching experience, and adult education background.

Age

The respondents' ages at the time of completion of the questionnaire were categorized as shown in Table 8. One respondent was twenty-five or younger, 28 were between twenty-six and thirty-five, 51 were between thirty-six and forty-five, 32 were between forty-six and fifty-five, and 10 were older than fifty-five. It is quite interesting to note that 68.02 percent of the population was between thirty-six and fifty-five, and that 76.21 percent were over thirty-five. Only 23.76 percent of the population were thirty-five or younger.

Sex

The distribution of male and female respondents shown in Table 8 indicates that 69 males, or 56.55 percent, and 53 females, or 43.44 percent, responded to the questionnaire.

Institutional affiliation

Respondents were categorized according to their institutional affiliation, and the responses are reported in Table 8. Twenty-four, or 19.67 percent, were from Glendale Community College; 29, or 23.77 percent, were from Mesa Community College; 15, or 12.29 percent, were from

Table 8

Frequencies and Percentages of Respondents Classified by Demographic Characteristics

Characteristic	Frequency	Percent
Age:		
25 or younger	1	0.81
26 through 35	28	22.95
36 through 45	51	41.80
46 through 55	32	26.22
Older than 55	10	8.19
Sex:		
Male	69	56.55
Female	53	43.44
Institutional affiliation:		
Glendale	24	19.67
Mesa	29	23.77
Scottsdale	15	12.29
Phoenix	37	30.32
Maricopa Technical	17	13.93
Teaching experience:		
0 through 5 years	23	18.85
6 through 10 years	42	34.14
11 through 15 years	22	18.03
16 through 20 years	19	15.57
21 or more years	16	13.11
Adult education background:		
Had attended one or more formal classes in adult education	40	32.78
Had attended workshops, conferences, or institutes in adult education	31	25.41
Had not participated in any organized adult education activities	51	41.81

Scottsdale Community College; 37, or 30.32 percent, were from Phoenix College; and 17, or 13.93 percent, were from Maricopa Technical Community College.

Teaching experience

Table 8 also indicates teaching experience in years at the time of completion of the survey. Of the respondents, 23, or 18.85 percent, had taught for five or fewer years; 42, or 34.42 percent, had taught between six and ten years; 22, or 18.03 percent, had taught between eleven and fifteen years; 19, or 15.57 percent, had taught between sixteen and twenty years; and 16, or 13.11 percent, had taught for twenty-one or more years. The largest number and percent of teaching experience was in the category of six to ten years. In addition, 81.13 percent of the respondents had taught for six or more years. Only 18.85 percent of the respondents had taught for fewer than six years.

Adult education background

The adult education background of the participants is indicated in Table 8. A total of 40, or 32.78 percent, indicated that they had attended one or more formal classes in adult education; 31, or 25.41 percent, indicated that they had attended workshops, conferences, or institutes concerned with adult education; and 51, or 41.81 percent, indicated that they had not participated in any organized adult education activity.

Table 9 indicates the mean score, standard deviation, and the percent of correct answers on the questionnaires. The questionnaire contained sixty items in Part II, concerned with other than demographic information. The total mean score for the 122 respondents was 29.84, with a standard deviation of 8.60. The proportion of correct answers was 49.6 percent. This indicates that the respondents knew 49.73 percent of the information on the questionnaire, and they did not know 50.27 percent of the information.

The scores on the instrument ranged from a low of 2 to a high of 42. Table 10 illustrates the frequency distribution of scores of 122 respondents on a sixty-item adult learner questionnaire. The information provided by Table 10 is presented graphically (Figure 3) in the form of a distribution curve. While Table 9 indicates the total mean score for the respondents, Table 11 indicates the mean scores, standard deviations, and percents for the four individual variables that comprise the total score.

On the orientation to learning variable, the respondents attained a mean score of 8.65, with a standard deviation of 2.14 and 57.6 percent of the correct answers. On the physiological changes variable, the respondents attained a mean score of 7.34, with a standard deviation of 2.94 and 48.9 percent of the correct answers. On the mental abilities variable, the respondents attained a mean score of 6.24, with a standard deviation of 2.39 and 41.6 percent of

Table 9

Total Mean Score, Standard Deviation, and Percent of Correct Responses to a Sixty-Item Questionnaire

Number of Items	Total Mean Score	Standard Deviation	Percent of Correct Responses
60	29.84	8.60	49.73

Table 10

Frequency Distribution Scores of 122 Respondents on a Sixty-Item Adult Learner Questionnaire

Class Interval	Frequency	Class Interval	Frequency
57-60	0	27-29	17
54-56	0	24-26	13
51-53	0	21-23	4
48-50	0	18-20	3
45-47	0	15-17	4
42-44	1	12-14	1
39-41	12	9-11	2
36-38	20	6-8	1
33-35	21	3-5	1
30-32	20	0-2	2

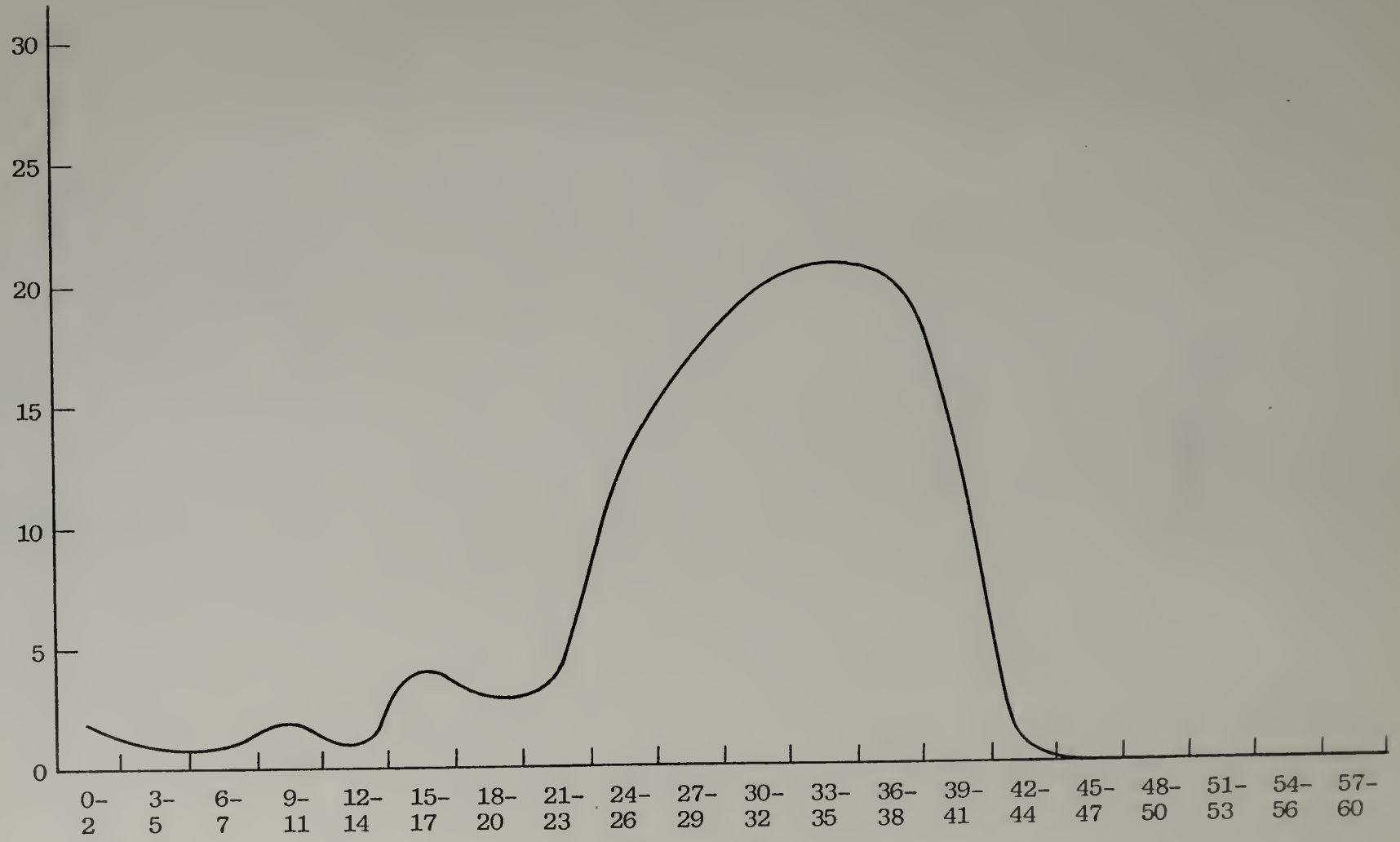

Figure 3

Distribution Curve: Frequency Polygon
Data from Table 10

Table 11

Mean Scores, Standard Deviations, and Percents for Respondents on Four Dependent Variables

Variable	Number of Items	Mean Score	Standard Deviation	Percent
Adults' orientation to learning	15	8.65	2.14	57.6
Physiological changes in the adult learner .	15	7.34	2.94	48.9
Mental abilities of the adult learner	15	6.24	2.39	41.6
Psychological factors in adult learning	15	7.53	2.53	50.2

the correct answers. On the psychological factors variable, the respondents attained a mean score of 7.53, with a standard deviation of 2.53 and 50.2 percent of the correct answers.

The respondents were least cognizant of the mental abilities variable; they were aware of 41.6 percent of the material and unaware of 58.4 percent. On the physiological changes variable, the respondents were aware of 48.9 percent of the information and unaware of 51.1 percent. On these two variables the respondents were aware of less than 50 percent of the material. The greatest awareness indicated by the respondents was to the orientation to learning variable; they were aware of 57.6 percent of the information and unaware of 42.4 percent. On the psychological factors variable, the respondents were aware of 50.2 percent of the material and unaware of 49.8 percent.

Hypotheses and Statistical Treatment

Hypothesis 1

"There are no significant differences in awareness level by age among the faculty at the five community colleges on the composite adult learner variables."

Statistical tests for Hypothesis 1.—The multivariate test of significance was used to determine if, with age as a factor, there was an overall significant difference

among the mean scores of the full-time faculty for the four dependent variables. The age ranges considered were:

25 years or younger

26 through 35 years

36 through 45 years

46 through 55 years

older than 55 years

Results.—The results of the statistical analysis are summarized in Tables 12 and 13. An inspection of these data indicated that the value of F was .8442, with $P < .6447$. This value was not significant and, therefore, the hypothesis could not be rejected.

Table 13 reports the univariate F tests for age as a factor in awareness. An inspection of the data in Table 13 indicated that the value of F was not significant on any of the four variables.

Hypothesis 2

"There are no significant differences in awareness level by sex among the faculty at the five community colleges on the composite adult learner variables."

Statistical tests for Hypothesis 2.—With sex as a factor, the multivariate test of significance was used to determine if there was an overall significant difference

Table 12

Multivariate Test of Significance, for Overall Significance of Age as a Factcr in Awareness by Faculty of the Four Dependent Variables

Variable	Age	N	Mean	S.D.
Orientation to learning	0-25	1	8.00	0.00
	26-35	28	8.96	2.15
	36-45	51	8.29	2.10
	46-55	32	8.96	2.17
	55+	10	8.60	2.27
Physiological change	0-25	1	6.00	0.00
	26-35	28	7.67	3.09
	36-45	51	7.19	3.01
	46-55	32	7.65	2.56
	55+	10	6.20	3.45
Mental abilities	0-25	1	6.00	0.00
	26-35	28	6.00	2.35
	36-45	51	6.07	2.48
	46-55	32	6.93	2.21
	55+	10	5.50	2.54
Psychological factors	0-25	1	7.00	0.00
	26-35	28	7.35	2.79
	36-45	51	7.60	2.34
	46-55	32	7.78	2.54
	55+	10	6.90	3.03

F = .8442 (not significant).

Table 13

Univariate F Tests of Significance of Age as a Factor in Awareness

Variable	M.S.	Univariate F	P
Orientation to learning	3.23	.701	.592
Physiological changes	5.56	.636	.637
Mental abilities	6.01	1.05	.383
Psychological factors	1.85	.282	.889

among the mean scores of the full-time faculty for the four dependent variables.

Results.—The results of the statistical analysis are summarized in Tables 14 and 15.

An inspection of the data in Table 14 indicated that the value of F, on a multivariate test of significance, was 3.0995, with $P < .0183$. This value showed an overall significant difference among the mean scores of full-time faculty that was sufficient to reject the null hypothesis at $P < .05$.

Table 15 reports the univariate F test for sex as a factor in awareness.

An inspection of the data in Table 15 indicated that for the psychological factors variable the value of F was 3.522, with $P < .002$.

As seen in Table 15, the mean score for the psychological factors variable was 8.01 for females and 7.15 for males, indicating a greater awareness level for females than for males. These findings indicated that sex was a significant factor for the psychological factors variable, at $P < .05$.

Table 14

Multivariate Test of Significance, for Overall Significance of Sex as a Factor in Awareness by Faculty of the Four Dependent Variables

Variable	Sex	N	Mean	S.D.
Orientaton to learning	Male	69	8.46	2.09
	Female	53	8.88	2.18
Physiological change	Male	69	7.40	3.00
	Female	53	7.24	2.87
Mental abilities	Male	69	6.31	2.49
	Female	53	6.13	2.26
Psychological factors	Male	69	7.15	2.63
	Female	53	8.01	2.32

$F = 3.099$, $P < .0183$.

Table 15

Univariate F Tests of Significance of Sex as a Factor in Awareness

Variable	M.S.	Univariate F	p
Orientation to learning ..	5.36	1.17	.2800
Physiological changes	.77	1.19	.2766
Mental abilities	1.04	.54	.4623
Psychological factors	22.1	9.28	.0029*

*P < .002.

Hypothesis 3

"There are no significant differences in awareness level by institutional affiliation among the faculty at the five community colleges on the composite adult learner variables."

Statistical tests for Hypothesis 3.—The multivariate test of significance was used to determine if, with institutional affiliation as a factor, there was an overall significant difference among the mean scores of the full-time faculty for the four dependent variables. The institutions considered were:

Glendale Community College
Mesa Community College
Scottsdale Community College
Phoenix College
Maricopa Technical Community College

Results.—The results of the statistical analysis are summarized in Tables 16 and 17. An inspection of these data indicated that the calculated value of F was 1.427, with $P < .1259$. This value was not significant and, therefore, the hypothesis could not be rejected.

Table 17 reports the univariate F tests for institutional affiliation as a factor in awareness. An inspection of the data in Table 17 indicated that for the orientation to learning variable the value of F was 4.09, with $P < .003$.

Table 16

Multivariate Test of Significance, for Overall Significance of Institutional Affiliation as a Factor in Awareness by Faculty of the Four Dependent Variables

Variable	Institution	N	Mean	S.D.
Orientation to learning ...	Glendale	24	9.16	1.80
	Mesa	29	9.00	1.51
	Scottsdale	15	7.46	2.06
	Phoenix	37	8.00	2.57
	Maricopa	17	9.76	1.71
Physiological changes	Glendale	24	7.45	3.16
	Mesa	29	7.51	2.74
	Scottsdale	15	6.46	2.55
	Phoenix	37	7.24	3.37
	Maricopa	17	7.82	2.29
Mental abilities	Glendale	24	6.75	2.25
	Mesa	29	6.55	2.21
	Scottsdale	15	5.13	2.53
	Phoenix	37	5.86	2.65
	Maricopa	17	6.76	1.88
Psychological factors	Glendale	24	7.62	2.60
	Mesa	29	7.58	2.47
	Scottsdale	15	6.66	2.35
	Phoenix	37	7.35	3.01
	Maricopa	17	8.47	1.06

F = 1.4277 (not significant).

Table 17

Univariate F Tests of Significance of Institutional Affiliation as a Factor in Awareness

Variable	M.S.	Univariate F	P
Orientation to learning ..	16.92	4.09	.003*
Physiological changes	4.25	.483	.747
Mental abilities	9.32	1.66	.162
Psychological factors	6.92	1.08	.368

*P < .003.

Because the hypothesis was rejected at the .05 level, it is assumed that this result occurred by chance.

Hypothesis 4

"There are no significant differences in awareness level by teaching experience among the faculty at the five community colleges on the composite adult learner variables."

Statistical tests for Hypothesis 4.—The multivariate test of significance was used to determine if, with teaching experience as a factor, there was an overall significant difference among the mean scores of the full-time faculty for the four dependent variables. The teaching experience considered was:

5 years or less

6 through 10 years

11 through 15 years

16 through 20 years

21 years or more

Results.—The results of the statistical analysis are summarized in Tables 18 and 19. An inspection of these data indicated that the value of F was 1.281, with $P < .206$. This value was not significant and, therefore, the hypothesis could not be rejected.

Table 19 reports the univariate F tests for teaching experience as a factor in awareness. An inspection of the

Table 18

Multivariate Test of Significance, for Overall Significance of Teaching Experience as a Factor in Awareness by Faculty of the Four Dependent Variables

Variable	Years of Teaching Experience	N	Mean	S.D.
Orientation to Learning	0-5	23	8.91	1.80
	6-10	42	9.07	2.27
	11-15	22	8.54	1.96
	16-20	19	7.78	2.43
	21+	16	8.31	1.88
Physiological changes	0-5	23	7.00	2.41
	6-10	42	7.92	3.11
	11-15	22	7.90	2.52
	16-20	19	6.05	3.48
	21+	16	7.00	2.70
Mental ability	0-5	23	5.86	2.05
	6-10	42	6.52	2.26
	11-15	22	7.13	2.07
	16-20	19	4.84	2.65
	21+	16	6.43	2.70
Psychological factors	0-5	23	7.73	2.13
	6-10	42	7.92	2.29
	11-15	22	7.95	2.33
	16-20	19	6.00	3.12
	21+	16	7.43	2.73

F = 1.281 (not significant).

Table 19

Univariate F Tests of Significance of Teaching Experience as a Factor in Awareness

Variable	M.S.	Univariate F	P
Orientation to learning ...	6.29	1.39	.238
Physiological changes	14.4	1.70	.152
Mental abilities	15.49	2.87	.025*
Psychological factors	14.06	2.28	.064

*P < .025.

data in Table 19 indicated that for the mental abilities variable the value of F was 2.87, with P < .025. Because the hypothesis was rejected at the .05 level, it is assumed that these results occurred by chance.

Hypothesis 5

"There are no significant differences in awareness level by adult education background among the faculty at the five community colleges on the composite adult learner variables."

Statistical tests for Hypothesis 5.—The multivariate test of significance was used to determine if, with adult education background as a factor, there was an overall significant difference among the mean scores of the full-time faculty for the four dependent variables. The adult education background considered was:

Had attended one or more formal classes in adult education

Had attended workshops, conferences, or institutes concerned with adult education

Had not participated in any organized adult education activities

Results.—The results of the statistical analysis are summarized in Tables 20 and 21. An inspection of these data indicated that the value of F was 1.826, with P < .073. This value was not significant and, therefore, the hypothesis

Table 20

Multivariate Test of Significance, for Overall Significance of Adult Education Background as a Factor in Awareness by Faculty of the Four Dependent Variables

Variable	Adult Education Background	N	Mean	S.D.
Orientation to learning .	Formal classes	40	9.20	1.71
	Workshops, etc.	31	8.87	2.07
	No participation	51	8.04	2.35
Physiological changes ...	Formal classes	40	7.57	2.87
	Workshops, etc.	31	8.09	2.32
	No participation	51	6.68	3.22
Mental abilities	Formal classes	40	6.50	2.29
	Workshops, etc.	31	6.58	2.18
	No participation	51	5.82	2.55
Psychological factors ...	Formal classes	40	8.07	2.09
	Workshops, etc.	31	8.25	2.32
	No participation	51	6.66	2.74

F = 1.826 (not significant).

Table 21

Univariate F Tests of Significance of Adult Education Background as a Factor in Awareness

Variable	M.S.	Univariate F	P
Orientation to learning ..	15.13	3.45	.0349*
Physiological changes	20.87	2.47	.0885
Mental abilities	7.57	1.33	.2681
Psychological factors	33.16	5.55	.0050**

*P < .034.

**P < .005.

could not be rejected. Although the hypothesis could not be rejected at the .05 level, it does show significance at the .07 level.

Table 21 reports the univariate F tests for adult education as a factor in awareness.

An inspection of the data in Table 21 indicated that for the orientation to learning variable the value of F was 3.453, with $P < .034$, and that for the psychological factors variable the value of F was 5.557, with $P < .005$.

As seen in Table 20, the mean score for the orientation to learning variable was 8.04 for those who had not participated in adult education classes, 8.87 for those who had attended workshops or conferences, and 9.20 for those who had attended formal classes in adult education. For the psychological factors variable the mean score was 6.66 for those who had not participated in adult education activities, 8.25 for those who had attended conferences or workshops, and 8.07 for those who had attended classes in adult education. This difference in mean scores indicated that individuals who had attended either formal classes or workshops and conferences on adult education had a higher level of awareness than did individuals who had not participated in any adult education activities. Because the hypothesis was rejected at the .05 level, it is quite possible that these results occurred by chance, but it is noteworthy that the two variables which did show significance at the .05 level

are the two variables on which the respondents as a group showed the highest level of awareness.

Comments of Respondents

In addition to the 122 usable returns, 12 respondents returned incomplete or blank answer sheets. Attached to these answer sheets were written comments pertaining to the questionnaire content or to their inability to respond to the questions based on a lack of familiarity with the items (see Appendix D).

The comments are discussed in Chapter V.

Summary

Chapter IV presented research findings produced by analysis of the data discussed in Chapter III.

CHAPTER V

SUMMARY, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

A summary of the study, including the problems, procedures, and analysis of the data, is presented in this chapter, followed by findings, conclusions, and recommendations.

Summary of the Study

Problem and purpose

The purpose of this study was twofold: (1) to ascertain the level of awareness, among the full-time faculty of the Maricopa County Community College District, of physiological changes in the adult learner, mental abilities in the adult learner, psychological characteristics of the adult learner, and orientation of the adult learner; and (2) to use information about level of awareness as a basis for recommendations in relation to faculty development.

To accomplish the purpose of this study, five null hypotheses were formulated concerning differences in awareness by faculty, utilizing the independent variables of age, sex, institutional affiliation, teaching experience, and adult education background.

Population

The population for this study included all full-time faculty at the five community colleges in the Maricopa County

Community College District. A random sample, stratified according to sex, was drawn from the population. The sample consisted of 150 faculty—93 males and 57 females.

Instrument

The instrument utilized in this study was a questionnaire developed by the researcher based on an extensive review of the research in the area of adult learner characteristics.

The questionnaire consisted of sixty-five items—five demographic questions and sixty general statements—divided into four areas:

1. Orientation of the adult learner (15 items).
2. Physiological changes in the adult (15 items).
3. Mental abilities in the adult (15 items).
4. Psychological factors in adult learning (15 items).

The respondents were asked to agree or disagree with each of the statements.

To insure that the questionnaire had face and content validity, the instrument was: (1) submitted to a panel of ten experts in the fields of adult education and psychology who reacted to the form, content, and wording of the questionnaire; (2) pilot-tested with full-time faculty at the five colleges in the Maricopa County Community College District who were teaching during the first summer session of 1976, to detect any ambiguity in the questions; and (3)

administered to forty students enrolled in two adult education graduate classes at Arizona State University for their reactions to the form and content of the questions.

Based on comments and suggestions from the panel of experts, individuals in the pilot study, and the students in the adult education classes, the instrument was modified and revised.

Treatment of the data

The responses were recorded on International Business Machines (IBM) general-purpose answer sheets. The data obtained were machine scanned and transferred to computer cards at the Arizona State University Computer Center.

The statistical technique utilized was multivariate analysis of variance. The Manova F test was computed to determine if there were overall significant differences among the mean scores of the full-time faculty, by factor, for the four dependent variables. The univariate F test was run to identify differences in the specific variables. The probability for accepting or rejecting the null hypotheses was at the .05 level of significance.

Analysis of the data

Analysis of the data was based upon responses from 122 full-time faculty. Of the 150 instruments mailed, 134 responses were received. Of the 134 received, 12 had missing data, reducing the usable returns to 122 (81.33%).

Demographic characteristics of the sample indicated that the largest percentage of respondents was in the age group between thirty-six and forty-five (41.80%), and 78 percent ranged in age from thirty-six to over fifty-five. The sample consisted of 69 males and 53 females. This sample was typical of the community college faculty in the Maricopa County Community College District.

Although the sample was randomly selected from a composite list of the faculty of the five colleges, the colleges were represented in approximate proportion to their faculty size. Phoenix College, having the largest faculty, represented 30.32 percent of the sample.

When classified according to teaching experience, the largest category was comprised of those who had been teaching between six and ten years (34.14%).

Of the respondents, 41.80 percent indicated that they had not participated in any organized adult education activities, 32.78 percent had attended one or more formal classes in adult education, and 25.40 had attended workshops, conferences, or institutes in adult education.

Mean scores, calculated from the 122 responses to the sixty-item questionnaire, indicated a total mean score of 28.84, with a standard deviation of 8.60. This indicated that the respondents as a group were aware of 49.73 percent of the information on the questionnaire and unaware of 50.27 percent. Mean scores, calculated for the four individual

variables comprising the questionnaire, indicated that for variable 1 (the adult's orientation to learning) the respondents attained a mean score of 8.65, with a standard deviation of 2.14, or 57.7 percent of the correct answers. On variable 2 (physiological changes in the adult learner) respondents attained a mean score of 7.34, with a standard deviation of 2.94, or 48.9 percent of the correct answers. On variable 3 (mental abilities of the adult learner) respondents attained a mean score of 6.24, with a standard deviation of 2.39, or 41.6 percent of the correct answers. On variable 4 (psychological factors in adult learning) respondents attained a mean score of 7.53, with a standard deviation of 2.53, or 50.2 percent of the correct answers. The respondents were least aware of mental abilities in the adult learner, with 58.4 percent of the material unknown, and physiological changes in the adult, with 51.1 percent of the material unknown.

The scores on the questionnaire ranged from a low of 2 of 60 correct to a high of 42 of 60 correct.

Five hypotheses were tested to study faculty awareness of the characteristics of the adult learner:

Hypothesis 1: There are no significant differences in awareness level by age among the faculty at the five community colleges on the composite adult learner variables. There were no statistically significant differences in

awareness level by the faculty on the composite variables when age was a factor. Hypothesis 1 was not rejected.

Hypothesis 2: There are no significant differences in awareness level by sex among the faculty at the five community colleges on the composite adult learner variables. Data presented in Tables 14 and 15 indicated that there were significant differences in awareness level of faculty on the composite adult learner variables when sex was taken as a factor. It was also found that sex was a statistically significant factor for variable 4 (psychological factors in adult learning). Hypothesis 2 was rejected.

Hypothesis 3: There are no significant differences in awareness level by institutional affiliation among the faculty at the five community colleges on the composite adult learner variables. There were no statistically significant differences in awareness level by the faculty on the composite variables when institutional affiliation was a factor. Hypothesis 3 was not rejected.

Hypothesis 4: There are no significant differences in awareness by teaching experience among the faculty at the five community colleges on the composite adult learner variables. There were no significant differences in awareness level by the faculty on the composite variables when teaching experience was a factor. Hypothesis 4 was not rejected. Looking at the total mean scores for years of teaching experience, the data indicate that faculty in the groups 16-20

years and 21 years and over had the lowest mean scores, while those teaching 6-10 and 11-15 years attained the highest mean scores.

Hypothesis 5: There are no significant differences in awareness level by adult education background among the faculty at the five community colleges on the composite adult learner variables. At the .05 level of confidence there were no significant differences in awareness level by the faculty on the total composite variables when adult education background was a factor. Adult education background was defined as having attended workshops or formal classes in adult education or, conversely, having never participated in any adult education activities. Although the hypothesis could not be rejected at the .05 level of confidence, it showed significance at the .07 level. The findings indicated that when there was a difference in awareness it was on variable 1 (orientation to learning) and variable 4 (psychological factors in adult learning). Because the ratio did not reach the .05 level of confidence, Hypothesis 5 was not rejected. Faculty who had not participated in any adult education activities achieved a lower total mean score (27.2) and lower scores on each of the dependent variables—orientation to learning (8.04), physiological changes (6.68), mental abilities (5.82), and psychological factors (6.66)—than did faculty who had attended either formal classes or workshops in adult education.

Some important observations that could not be measured quantitatively evolved from the study. Comments attached to twelve questionnaires were categorized as follows: The respondents (1) did not possess the knowledge or experience to respond to many of the questions, (2) believed they were being tested, (3) felt the statements pertaining to physiological changes during adulthood were untrue, (4) indicated the questions were too simple, and (5) indicated the questions were too scientific.

Findings

Based on the analysis of the data, seven specific findings are offered:

1. Community college faculty were not aware of 50.27 percent of researched material pertaining to the characteristics of the adult learner.

2. The community college faculty were least aware of the areas pertaining to physiological changes and mental abilities of the adult learner.

3. The community college faculty were most aware of the areas relating to psychological factors in adult learning and the adult's orientation to learning.

4. Females had a greater awareness of the characteristics of the adult learner than did males.

5. Faculty having the most teaching experience attained the lowest awareness score.

6. Faculty with 6-15 years of experience attained the highest awareness score.

7. Those faculty having no adult education background attained a lower total mean score on the characteristics of the adult learner than did those faculty having attended either formal classes or workshops in adult education.

Conclusions

Based on the findings of the study, the following conclusions are offered.

As a majority of the respondents (78%) were over thirty-five years of age, it can be concluded that, as a group, they were unaware of many of the adult learner characteristics, especially in the areas of physiological change and mental abilities of the adult learner. This may imply that having attained a certain age does not insure knowledge or understanding of the changes in adulthood. It is possible that many in this age bracket did not wish to face the changes in themselves and therefore may have denied them in others.

Since females, more than males, showed a higher awareness of the psychological factors in adult learning, it might be concluded that female instructors had a greater awareness of the ongoing developmental needs of their adult students.

Being more aware of the psychological factors affecting adult learning, women might be more supportive of

changing both the form and the content of the curricula to reflect student needs.

In a study of the relationship of teacher role orientation and perceived teaching effectiveness, South (1975) found that female teachers were perceived more effective than their male counterparts. This result compares to the present study, which indicates that females had a greater awareness of adult characteristics than did males.

An implication of the greater awareness by females of adult characteristics may be in the area of recruitment and selection. All other factors being equal, this may give impetus for the recruiting and hiring of more female instructors on the community college level.

Since faculty having the most teaching experience attained the lowest awareness score, it might be concluded that faculty with the greatest number of years of teaching experience were least aware of the characteristics of the adult learner.

Further, since faculty having 6-15 years of teaching experience attained the highest awareness score, it could be concluded that faculty with fewer years of teaching experience were more aware of the characteristics of the adult learner. This conclusion takes on added significance when compared with a study by Ryans (1960). In a comprehensive study of teacher characteristics, Ryans disclosed a relationship between amount of teaching experience and effectiveness.

He found that teachers having five to nine years of experience were higher on more criteria than were teachers having fewer or more years of experience. The teacher criteria were: (1) understanding, friendly vs. aloof, egocentric, restricted teacher behavior; (2) responsible, businesslike, systematic vs. evading, unplanned, slipshod teacher behavior; and (3) stimulating, imaginative, surgent, or enthusiastic vs. dull, routine teacher behavior.

This research corroborates the present study which indicates that those faculty with the most teaching experience scored the lowest on the characteristics of the adult learner, while those having 6-15 years of teaching experience attained the highest scores.

From the finding that faculty having no adult education background attained a lower total mean score on the characteristics of the adult learner than did faculty having attended formal classes or workshops in adult education, it can be concluded that those instructors who engaged in some form of adult education appear to have been more aware of the learning characteristics of their adult students.

Dickinson and Rubidge (1973), in a study testing knowledge about adult education, administered a 100-item test to 124 students enrolled in graduate and undergraduate adult education courses. Results indicated that the chief factor influencing test scores was the number of previous university courses in adult education. According to their

data, the number of previous university courses was the only variable showing a significant association with the total test score at the .01 level of confidence.

Significance of the study

Perhaps the most significant outcome of this study was the fact that 50.27 percent of the material pertaining to the characteristics of the adult learner was unknown to the full-time faculty in the Maricopa County Community College District. Although there was no established direct relationship between responses on the questionnaire used in this study and measures of teacher effectiveness, there is an implicit assumption about the importance of instructors having a knowledge of the characteristics and needs of their students. This assumption is supported by Waetgen (1961) in a collection of papers and reports presented at the Fifth Curriculum Research Institute, sponsored by the National Education Association, Washington, D.C. The articles included reflect the institute's position which recognizes that a teacher must *know* the child whom he is to teach; knowing the children's experiential background enables the teacher to alter the sequence of curriculum content and the pace of presentation.

Based on his experience, Knox (1974) indicates that successful facilitators of learning seem to have three types of understanding: they understand what is to be learned,

they understand the learners, and they understand useful procedures to help learners build on their present competencies. He also notes that those who facilitate adult learning will be more likely to be effective if they are alert to the needs that influence participants in continuing their education.

Ryans (1960:2) indicates that there are no universally acceptable definitive answers to the question about what constitutes effective teaching. It is known, however, that some teachers are more effective with certain types of students than with others, suggesting that a teacher's awareness of student characteristics will add to the teacher's effectiveness.

In a study designed to measure teaching efficiency (Lancelot, Barr, et al., 1935:4), the following criteria were used to measure teaching effectiveness: (1) the quality of work done, as indicated by the average grade received by the group as a whole in all later courses of the prescribed sequence; (2) the persistence of students in continuing to the end of the sequence, as indicated by the percentage of the subsequent required courses taken by them.

They found that differences in the subsequent performance of students, which are associated with instruction by particular teachers, unmistakably exist. Their study also indicated that, by assigning students those teachers shown

best able to teach them, an increase both in completion of courses and in grades could be expected.

A recent study by Cunningham (1975) augments the results of Lancelot and Barr (1935). This study tests the hypothesis that types of students tend to differ in the benefit that they receive from various types of teachers. Factor analysis was used to identify four types of students and four types of teachers. The findings from the analysis of variance procedure were that a certain type of teacher was significantly more effective with one type of student than with another.

An implication that can be drawn from Lancelot, Barr, and Cunningham's research and the present study is in the area of staff utilization. The knowledge that different types of teachers tend to differ in the success they experience with the same type of student, and that different types of students tend to differ in the benefit they receive from the same type of teacher might provide a basis for differentiating the community college faculty by matching effective teachers of adults with adult students.

Cunningham (1975) argues that, in addition to a continuing search for general characteristics of all good teaching, the pursuit of the most effective pairings of students with teachers holds considerable promise for improving the productivity of classroom environments. There is a need to expand the focus of research related to teacher effectiveness

from unidimensional analysis of teacher characteristics to multidimensional analysis of both student and teacher characteristics.

Limitations of the study

The questionnaire used in this study measured knowledge of research findings regarding the characteristics of the adult learner and did not measure application of knowledge. No attempt was made to ascertain what teaching techniques and methodologies teachers actually were employing in their classrooms.

The demographic data relating to adult education background did not differentiate between the number and content of adult education courses and workshops. Greater differentiation of adult education background would have aided analysis of the data.

This study measured level of awareness by community college faculty, and no attempt was made to correlate awareness of adult learner characteristics with teacher effectiveness.

Recommendations

Instructors should further investigate the physiological changes in aging, the psychological factors in adult learning, the mental abilities of the adult learner, and the

orientation of the adult learner to further enhance their teaching effectiveness.

Counselors should work with adults in attaining a more realistic appraisal of the aging process and serve as a resource to the faculty in attaining a productive learning environment.

After further investigation of teaching effectiveness and questionnaire scores, school districts might consider the following: (1) providing in-service training for full-time faculty in the area of adult learning characteristics; (2) differentiating staffing by identifying those teachers best able to work with adults; (3) requiring courses in characteristics of the adult learner for certification of instructional personnel; (4) requiring courses in the characteristics of the adult learner for maintenance of certification of currently certified instructional personnel; (5) sponsoring workshops in the areas of mental abilities and physiological changes in the adult; (6) utilizing the questionnaire employed in this study as a diagnostic tool in determining faculty need in the area of adult characteristics; (7) recruiting faculty having courses and/or workshops in adult education; and (8) recruiting more female faculty.

Recommendations for further study

1. After validating the questionnaire with teacher effectiveness and/or learner performance, this study should

be replicated on other populations, such as university faculty, community college administrators, and other persons working with adult students, so that norms may be established.

2. To extend the usefulness of this instrument, additional categories, such as course planning, adult instruction, and evaluation, should be researched, validated, and added to the existing questionnaire.

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APPENDICES

APPENDIX A

QUESTIONNAIRE

QUESTIONNAIRE

PART I - BACKGROUND INFORMATION

Directions: *Use the accompanying electronic answer sheet. Use black lead pencil only. Make heavy black lines that fill the space completely. Erase any answer you wish to change. Do not make any stray marks on this answer sheet. For items one (1) through five (5) mark the letter of the response that identifies your personal background information.*

1. Age:
   - A. 25 years of age or under
   - B. 26 - 35 years old
   - C. 36 - 45 years old
   - D. 46 - 55 years old
   - E. over 55 years of age

2. Sex:
   - A. Male
   - B. Female

3. Institutional Affiliation:
   - A. Glendale Community College
   - B. Mesa Community College
   - C. Scottsdale Community College
   - D. Phoenix College
   - E. Maricopa Technical Community College

4. Teaching Experience:
   - A. 0 - 5 years
   - B. 6 - 10 years
   - C. 11 - 15 years
   - D. 16 - 20 years
   - E. 21 or more years

5. Adult Education Background:
   - A. I have attended one or more formal classes in adult education.
   - B. I have attended workshops, conferences or institutes concerned with adult education.
   - C. I have not participated in any organized adult education activities.

PART II - CHARACTERISTICS OF THE ADULT LEARNER

Directions: *Continue using the accompanying answer sheet for items six (6) through sixty-five (65). The following list contains a series of general statements about the characteristics of the adult learner (over 25 years of age). If you agree with the statement darken space A on the electronic answer sheet. If you disagree darken space B on the electronic answer sheet. Please answer each question one way or the other.*

6. Adult students should be encouraged to relate new or difficult concepts to their existing knowledge.

7. In helping adults to learn, reward is more effective than punishment.

8. Adult learners are often problem centered rather than subject centered.

9. It is difficult for an adult to do a familiar task in an unfamiliar way.

10. An adult's experience is an increasing resource of learning.

11. Andragogy is the art and science of helping adults learn.

12. Adult learners want educational experiences which relate to job/life situations.

13. In the adult learning process, grading rather than self-evaluation is more effective.

14. An adult's experience may interfere with the learning process.

15. Adult students should be involved in formulating their learning objectives.

16. Adult learners desire minimum time expenditures to complete their educational objectives.

17. Older students should not be allowed to set their own learning pace.

18. Most adults have higher standards of performance than children or youth.

19. Adult students often lack necessary study skills.

20. Adults and children have the same orientation to learning.

21. Maximum auditory acuity is attained between 10 and 15 years of age.

22. In the aging process, there is a loss of auditory acuity on the high tones.

23. Loss of hearing reduces the ability to recall long sentences.

24. Many older adults find it difficult to follow rapid speech in spite of little or no hearing loss.

PART II - CHARACTERISTICS OF THE ADULT LEARNER (CONTD.)

25. For normal learning tasks an adult by age 30 requires 120 watts of illumination while by age 50 180 watts are required.

26. After age 15 there is a gradual, but consistent decline in hearing to about 65 years of age.

27. The inability to hear can produce emotional disturbances such as, depression, anxiety, or frustration.

28. Visual acuity attains its maximum at about 18 years of age.

29. With advancing age the lens loses its elasticity and cannot focus readily.

30. A major change in visual acuity occurs between age 50 and 60.

31. About 85% of all learning occurs through the use of the eyes.

32. Speed of reaction time tends to decline with age.

33. There is a somewhat greater tendency for women to show impaired hearing than for men.

34. As we age, we slow up in our reaction to auditory stimuli.

35. Speed of performance does not decline with age.

36. Adult learning ability is influenced by the amount of formal education received.

37. The pattern of mental abilities does not change with age.

38. Age in itself does little to affect an individual's power to learn or to think.

39. Scores on tests such as vocabulary show increases with age.

40. Compared to youth, adults usually require a longer time to perform learning tasks.

41. Scores on tests measuring perception and dexterity show no decline with age.

42. An adult's ability to learn is influenced by his occupation.

43. Older students retain as much information from oral presentations as younger students.

44. Older students have a quantitative disadvantage when compared to younger students.

45. Age influences the speed of learning.

PART II - CHARACTERISTICS OF THE ADULT LEARNER (CONTD.)

46. The natural course of aging does not include cognitive decline.

47. Motivation of the adult taking a test is a major factor in performance.

48. Recency of participation in an educational activity is related to an adults ability to learn.

49. The most critical years in the aging process occur between the 50th and 70th years.

50. Decline in speeded motor tasks begins between the ages of 18 and 40 years.

51. Adults are often inhibited from active participation in discussion by a lack of confidence in their own ability.

52. Frequently the fear of aging, rather than the aging process itself induces mental deterioration.

53. Adults even more than children are sensitive to failure in their learning situation.

54. Adults rarely hold the opinion that they are unable to learn.

55. Adults are concerned with maintaining and enhancing their social worth and success.

56. The adult has a less realistic attitude toward time than youth.

57. Adulthood is not a developmental period in itself.

58. Once the adult has formed a perception of a stimulus it is difficult for him to change his mind.

59. Developmental tasks of the adult years are related to the evolution of social roles.

60. In teaching adults extrinsic motivation is more important than intrinsic motivation.

61. The concept of developmental tasks provides a way of identifying the educational needs of adults.

62. Emotional association with words or events may affect the adult in gaining new knowledge.

63. A phenomenon of the adult years is the universal experience that time seems to pass faster as one grows older.

64. With few exceptions liking for occupations increases with age.

65. Adult learners enter a learning situation with a high readiness to learn.

APPENDIX B

COVER LETTER

Phoenix College
MARICOPA COUNTY COMMUNITY COLLEGE DISTRICT
1202 WEST THOMAS ROAD • PHOENIX, ARIZONA 85013

September 1, 1976

Dear Faculty Member:

The number of adult students in the Maricopa County Community College District is rapidly increasing. About 50% of the students enrolled in the district are over 25 years of age. Relatively little research has been conducted concerning this population in community colleges.

In responding to this need, the Maricopa County Community College District has given clearance to conduct a study dealing with adult characteristics. Your name has appeared in the test sample. The confidentiality of all respondents will be honored.

Your participation in this research project will augment the research in adult education and further improve the education of adults in the Maricopa County Community College District.

Please complete the enclosed questionnaire and return it with the answer sheet in the 8 1/2" X 11" intercampus envelope provided. Return to: Maxine Rossman, Counseling Department, Phoenix College. Please do not fold or bend answer sheet.

I would appreciate having the information returned by September 15 in order to meet time lines. If you have any questions, please call me at 839-4682.

Thank you for your cooperation.

Sincerely,

Maxine Rossman

Maxine Rossman

APPENDIX C

FOLLOW-UP LETTER

Phoenix College
MARICOPA COUNTY COMMUNITY COLLEGE DISTRICT
1202 West Thomas Road • Phoenix, Arizona 85013

September 27, 1976

Dear Faculty Member:

On September 1, a cover letter, questionnaire and answer sheet was mailed to you, requesting your participation in a research study pertaining to adult characteristics. As of this date we have not received your completed information.

This study is being conducted on a sampling basis. Your returning this information would greatly help in the success of the project. Would you please take a few minutes to complete and mail the requested information?

Another questionnaire and answer sheet has been included with this letter. If possible, please return the questionnaire within five days. Return in the intercampus envelope provided to: Maxine Rossman, Counseling Department, Phoenix College.

Please do not fold or bend answer sheet. If you have any questions, please call me at 839-4682.

Thank you for your cooperation.

Sincerely,

Maxine Rossman

Maxine Rossman

APPENDIX D

RESPONDENT COMMENTS

RESPONDENT COMMENTS

1. I'm sorry I cannot answer these questions. I just do not have enough knowledge or experience to deal with them.

2. What do I know about adult characteristics that can help you?

3. If you get your information from someone like me—who knows nothing about it—you'll be as smart as I am.

4. I don't know much about adult education.

5. I felt it was an imposition on my time to ask me to answer that many questions about the characteristics of the adult learner.

6. Questions were too specific and scientifically oriented.

7. I found this questionnaire to be oversimplified.

8. This questionnaire "smells" of a department of education.

9. I will not answer any questions trying to test my knowledge.

10. I do not have the necessary experience to answer.

11. I found the questions on physiological changes hysterical and ridiculous.

12. I neither agree nor disagree with most of the statements in Part II.